

The SKB User Guide

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Abstract

This L^AT_EX package can help to build a repository for long living documents. It focuses on structure and re-use of text, code, figures etc. The basic concept is to first separate structure from content (i.e. text about a topic from the structure it is presented by) and then separating the content from the actual published document, thus enabling easy re-use of text blocks in different publications (i.e. text about a protocol in a short article about this protocol as well as in a book about many protocols); all without constantly copying or changing text. As a side effect, using the document classes provided, it hides a lot of L^AT_EX from someone who just wants to write articles and books.

1

Contents

1	The Intent	1
2	The Story	2
	2.1 The Short Story	2
	2.2 The Long Story	2
3	The Concept: Separate Things	3
	3.1 Separate Content from Structure: the Repository Folder	4
	3.2 Separating different Parts of a Document	5
4	User Manual	8
	4.1 Getting Started	8
	4.2 Files, Figures and Slides	13
	4.3 Filenames, Acronyms and References	17
	4.4 Other useful Macros	17
5	Examples	20
	References	21

1 The Intent

Provide a L^AT_EX package that helps to create and maintain a repository for long-living documents. It's probably not usefull for some short-term articles, however, I learned that most of my short term articles eventually become part of my long-term documents. Here you go. The repository should allow for easy access to 'stuff': text blocks, senteces, paragraphs, sections, complete chapters. But

¹ Note: This article is part of the **SKB**² package. It is typeset separated from the original documentation to show the usage of the `\skbarticle` class and to provide an example for the usage of the **SKB**.

also to figures, code snippets, examples, etc. And I do want to limit the amount of repetition of information. For example, if I use a certain example in an article I might want to use the same (identical) example in a book or a presentation or lecture notes. If I only copy the example I have to maintain several sources, and over time I will not remember which of them is normative. As a side effect, I also want to optimise document creation and limit the \LaTeX or document class specific code in my documents.

2 The Story

2.1 The Short Story

I have written papers, done a lot of presentations, provided some book chapters, still working on a book, participated in many research proposals and projects, and created tons of notes and figures. As of early 2009, most of that information was distributed over the repositories of different projects and organisations I worked for, in some document management systems, on several websites, databases, my preferred email client (which changed twice), different computers and later even different external hard drives and **USB**³ sticks. Looking for specific text or a particular figure could easily end in a days work. Tools like desktop search engines can help to find 'stuff'. I used them, but if they found anything it was hard to maintain the context it was written in and some formats or sources were out of reach for them. Even worse with figures and the many versions some of them evolved in over time. After multiple jobs and several years, all I had is kind of a very messy base of knowledge, well-hidden somewhere, thus very difficult to locate and impossible to maintain.

So I started early 2009 to re-organise my 'stuff'. At the same time, I did realise that moving away from \LaTeX was part of the problem (and I thought using the other text processor would help, it actually didn't, long-term). So \LaTeX became, again, the text processor of choice, and with it the ability for a complete different approach to organise my 'stuff'. This was the moment the **SKB** was created. **SKB** stands for Sven's Knowledge Base. The \LaTeX package **skb**, described in this article, forms part of a larger software system that uses **SQL**⁴ite databases, a small **PHP**⁵ framework, Apache for **HTML**⁶ access and recently also a Java port.

My document repository uses the **skb** package, so most of my documents are eventually \LaTeX documents. I am saying eventually because I still use other tools (like Microsoft's Powerpoint), but integrate their output in my repository. I do all my figures these days using Inkscape, so the source is **SVG**⁷ and the output for \LaTeX documents **PDF**⁸. For editing the text files I do flip between UE Studio and LeD. Parts of the content (such as acronyms and bibliographic information) are maintained in **SQL**ite databases and exported to \LaTeX . This package now shows how I build my documents.

2.2 The Long Story

Over several years of writing documents (articles, books, reports, standards, research proposals) ideas and concepts became distributed (actually a euphemism for 'hidden') within many many documents (in all sorts of formats) located at many many locations (such as local file system,

³Universal Serial Bus (**USB**)

⁴Structured Query Language (**SQL**)

⁵PHP Hypertext Preprocessor (**PHP**)

⁶Hyper Text Markup Language (**HTML**)

⁷Scalable Vector Graphics (**SVG**)

⁸Portable Document Format (**PDF**)

document management system, subversion/perforce systems, web servers, email clients). The problems associated to this situation are manifold:

- Ideas/concepts are hidden, often un-accessible and, as I experienced, search tools are of limited help.
- The documents are written in all sorts of formats or available only in (usually proprietary) binary formats. Ever tried to open a document written in **MS**⁹ WinWord 6.0 with customised document template in a newer version of the same programme? You know then what I am talking about.
- Reusing the ideas/concepts, once found in a document and managed to open that very document, usually involves huge amount of re-formatting. This will produce mistakes. Ever tried to use a **L**A_TE_X generated reference list, found in a **PDF** file in a new article? I found better ways to spend my nights and weekends (yes, I am married and I have a garden).
- Over time, it can become very difficult to distinguish between different versions of a document, concept and/or idea. As it happens in real life, things move on even in computing and the related sciences. Documents are written for a specific historic context, which might but often will not appear in their abstract (or the name of the folder their are stored in).
- The above issues do apply to figures and presentations as much as to the text part of documents. Reorganising my documents/figures/presentations I did find way too many duplicates. I have used too many graphic software packages in the past 10 years which don't exist anymore, or which do not run on the latest version of my preferred operating system. Some of the figures are only available in some sort of low-resolution bitmap, rendering them useless even for a non-peer-reviewed article today (the original source got 'lost', in most cases because someone removed the project folder after the project was terminated).

A solution is to create a unified document repository, then use this repository as 'normative source' to create documents for specific purposes while leaving the text blocks, headings, figures, presentations, references, acronyms and all other reusable 'stuff' in the repository for the next document which might (hopefully will) benefit from them. This can (did it for me already) save a lot of time, demands archiving (of published documents, thus creating a traceable history), helps to keep important information updated (without jeopardising any other work) and prevents losing any 'stuff'.

The repository needs a few rules, a (customisable) structure but beside that only a bit of effort to be maintained. To give an example: while writing the first version of this article (May 11, 2009), I have moved 4 lecture notes, 2 presentations, 1 book chapter, 1 book (in writing), 1 textbook (for students, with 4 chapters) and 4 articles from my 'mess' into my repository. This involved some re-formatting (plus the occasional re-drawing) to bring the original sources into the target formats. At the same time I did develop the rules of my repository, the structure and the (mostly **L**A_TE_X) code (and re-wrote/structured/ruled most of them a few times). I ended up with 1,314 files in 87 folders, which create 9 articles, 2 books, 1 textbook, 3 lecture notes and this document (note: the number of articles increased, because I could re-assemble 'stuff' for new uses, spending some five minutes per one new article). I did remove roughly 100 pages of text (take the classic Spring **LNCS**¹⁰ format and you get the point of the number of characters) and some 40 figures (all duplicates). I did find way too many errors in the original sources (most of which have been created by 're-using' them earlier from even more-original-sources).

3 The Concept: Separate Things

You already got the idea that separation is important, reading about published documents and a normative repository. The basic idea is: think separation – separate as much as you can, but not

⁹Microsoft (**MS**)

¹⁰Lecture Notes in Computer Science (**LNCS**)

more. I know that this sounds like a strange idea when the goal is a unified repository, but it is essential. So we separate several concerns (taking a concept of distributed system design). So if we want to facilitate re-usability, we have to:

1. separate content of a document from its structure and
2. separate the different parts of a document.

For the impatient:

1. Separating content from structure means to identify small, coherent blocks of information, i.e. text describing a certain aspect or an example, and put them separated into the repository folder.
2. Separating parts of a document means to separate the part that is important for publishing from the part that is important for the content and put them into different places (one in the publish folder and the other one in the repository folder). It also means to build a separate repository for figures, since they could be used in many different small blocks of information.

3.1 Separate Content from Structure: the Repository Folder

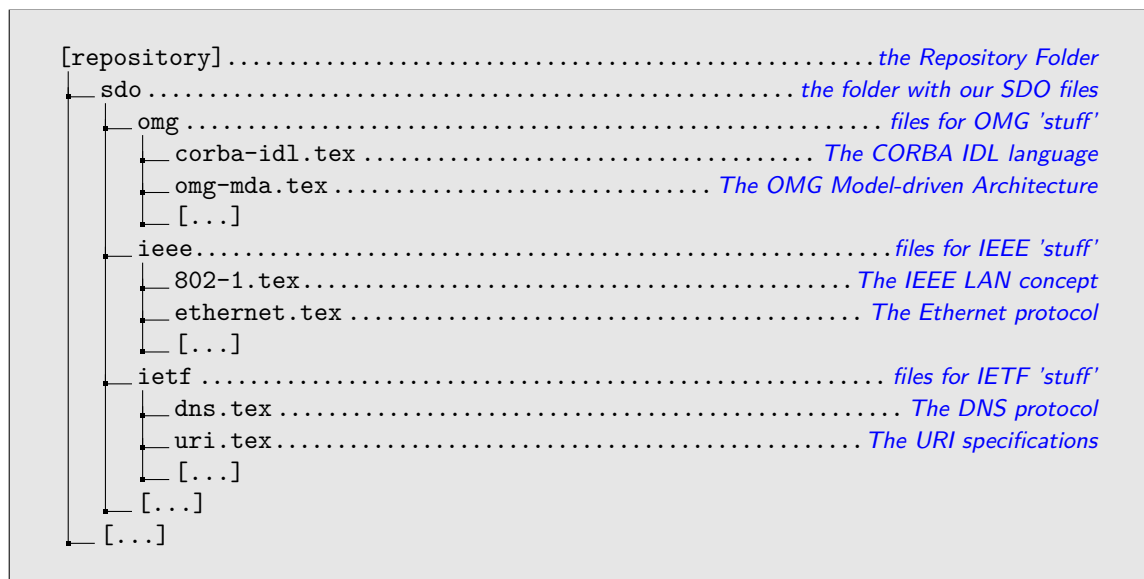
Now, separating the structure from the content first. The structure of a document (we stay with classic text documents like articles, books, etc. for a while) is words in sentences in paragraphs in (sub-) sections in chapters (if its a book, of not only sections)¹¹. We collect sentences and paragraphs but separate them from headings. L^AT_EX is doing that already with the macros for chapters and sections. We go one step further and provide a generic way to identify a heading with the **SKB** macro `\setheading`. This allows to select the appropriate L^AT_EX heading level at a later stage having the context of that later stage in mind (i.e. it might be a section in an article but a chapter in a book). Now we create a structure for the resulting files in our repository, adding meaningful names to the directories and files. Obviously the names of these folders should provide some idea about the general characterisation of the files they contain. Example? Well, if you collect information from **SDO** the top folder could be named `sdo` and the sub-folders using the respective Standard Defining Organisation (**SDO**) acronyms, such as `omg` for the **OMG**¹² and `ieee` for the **IEEE**¹³ and `ietf` for the **IETF**¹⁴. We put all this in a folder named repository, making it explicit that here is where we find all our normative content. The following example shows how that looks like.

¹¹One very meticulous person might add 'characters' and mention that there are more ways to think about a document's structure. But that person is not me. The structure I used fits the purpose (as of now), if it doesn't anymore I will look further.

¹²Object Management Group (**OMG**)

¹³Institute of Electrical and Electronic Engineers (**IEEE**)

¹⁴Internet Engineering Task Force (**IETF**)



The result: we have a structure of files, containing our 'stuff', integrated in a structure of folders that allows us to find it (the better this structure the more helpful it is, and remember this is a 'personal' repository, so your personal flavour is king).

3.2 Separating different Parts of a Document

The next step is to separate the remaining parts of a document based on their semantics. You are probably doing that already if you maintain a database for bibliographic information and have many of your articles using it. But we can and should do much more than that.

3.2.1 Bibliography, Acronyms and Figures

So the combination of \LaTeX and \BibTeX already helps us for this separation. Using the acronym package, we can extend this to acronyms. Looking into the highly common re-use of figures, we should look into this as well. Let's take the organisation of bibliographic information as a template. I store them using \BibTeX and process them with the biblatex package (but that is not critical for now). My \BibTeX database is in a special folder (we can call it **references** for the moment) and it uses a file structure that helps me to find information. This structure is based on the \BibTeX and biblatex classification, i.e. proceedings, article, book, thesis, standard, etc.

Now, I can do the same for figures: put them into a special folder (we can call it **figures** for the moment), which contains the source of the figures and the generated formats I need for my documents (usually **PDF**, some **PNG**¹⁵). Now I can reference these figures from the repository as well as for other use cases, such as web publishing or presentations¹⁶.

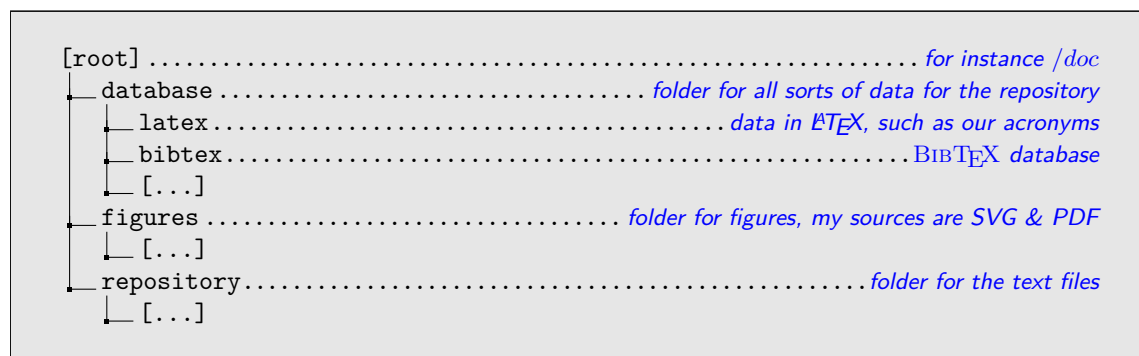
Last not least, the **acronym** package allows for an automatic handling of acronyms, including list of acronyms. It is very similar to \BibTeX in that it will only show the acronyms used in a document out of a (potentially large) database.

¹⁵Portable Network Graphics (**PNG**)

¹⁶My figures are exclusively in **SVG** using inkscape (www.inkscape.org). This has the advantage of a standardised, text-based format with many export options. All my figures are in a single root folder, structured very similar to the document folders created above, but separated from it. This makes re-use of figures very easy.

One might also want to create other specific structures, such as for programming code. Don't stop yourself, it's easier to combine things later (if the separation is not effective) than to separate things that are hugely integrated into each other. For one of my internal projects, a parser generation environment based on [ANTLR](#)¹⁷, I created a special folder for the EBNF specifications along with railroad diagrams. Now I can use them in my book and my papers.

Now we name the folders for the separated content. This is straight forward, although you might want to use different names (don't worry, the `skb` supports that). We add to the already created repository folder the things we need for figures (`figures`) and combine acronyms and `BIBTEX` in a folder called `database`, separating the data from all other content¹⁸. Now the directory structure looks like this:



What did we do so far? We did separate the different parts of our documents. The more clinical you are, the better the result will be. But please note: separate as much as you should, not as you could. If you don't find a reason for separating 'stuff', then don't do it!

3.2.2 Publications and Content

Here is where it might get slightly more complicated than in the first few steps. And you might see already that the reason for that is separation! We didn't finish the separation, we have to go one step further. And that means to separate now the contents (with the references and acronyms and figures) from the reason to publish a document. This last step of separation is more conceptual, being focused on the *why?* and *where?* and *how?* we publish, rather than being focused on the *what?* we publish.

So we do publish for many reasons: articles for research, project proposals, reports, lecture notes, standard documents, annotated presentations, sometimes even books. We publish for a specific purpose, in a specific (soon historic) context, using the requested format (and style sheets) and a particular structure of our document that fits the purpose. That means we organise and structure our content every time according to these constraints. Thus we need a new directory structure for that, since we will not reuse that as often as our 'stuff' itself. Remember, we use the `skb` macro `\skbheading` for headings, not the classical `LATEX` macros like `\section`, so our files effectively do not contain much information about their place in the structure, only that they claim one¹⁹. This comes in handy now, since all we have actually to do is to assign a document

¹⁷Another Tool for Language Recognition ([ANTLR](#))

¹⁸Now, the reason for the database folder and its structure is that the whole `SKB` contains more databases, all of which reside here. If you want to simply apply this to `LATEX` documents you might want to use a different structural approach.

¹⁹Currently experimental, but soon to be ready, there will be an extension to the `\skbheading` macro that allows a little bit more information to be put in the repository files. For the moment this is captured in the `\skbheadingduc` macro.

heading level to every repository file we load. Let's create a folder for the published documents and call it **published** with a set of sub-folders that help us to understand the general context of the publication. My directory structure could look like this:

```
[your repository root] ..... path to your repository, like /dev/documents
├── [...]
├── publish ..... folder for published documents
│   ├── articles ..... ...such as articles
│   ├── books ..... ...or books
│   ├── lecture_notes ..... ...or lecture notes for computer science
│   ├── presentations ..... ...or general presentations
│   └── [...]
└── [...]
```

We could, and it usually makes sense to do so, go one step further in that separation. This time within the documents in the **published** folder. The reason is the structure of \LaTeX documents: they do need some commands specific to \LaTeX , which we don't necessarily want to mix with the commands that input our content (the files from repository). So it would make sense to have another pair of documents here, one containing all \LaTeX commands needed to create a document, and one containing all the commands that include our content. Say we have a few articles for state of the art discussions on *naming*, *object-models* and *protocols*, we could create the following structure for the **article** folder:

```
articles ..... our articles
├── naming.tex ..... the file creating an article on naming
├── object-models.tex ..... the file creating an article on object-models
├── protocols.tex ..... the file creating an article on protocols
├── tex ..... a folder containing the tex files that include our content
│   ├── naming.tex ..... the file including all content for naming
│   ├── object-models.tex ..... the file including all content for object-models
│   └── protocols.tex ..... the file including all content for protocols
```

Now everything is structured, thus simple again. If we are looking for content, we go to the **repository** directory and the directory names help us to find what we are looking for. If we need a figure, we do the same at the **figures** directory. **acronyms** and **bibtex** help with the respective other content. If we want a specific published document, we simply check the **published** directory and will have a look into a **tex** sub-directory to see what content is include how.

Good news, the separation is finished! What have we done? We have separated the contents from the structure by creating, created a separate directory structure for figures, another one for bibliographic data, one for acronyms and finally a complete directory structure for published documents. Content and title form a pair, include figure, use acronyms and references and are combined in the published documents. At this point we can start calling it document repository.

3.2.3 The Final Directory Structure

As this is the final and complete root directory of our repository:

```

[your repository root] ..... path to your repository, like /dev/documents
├── database ..... folder for all sorts of data for the repository
│   ├── latex ..... this is where LATEX data will be collected, such as our acronyms
│   └── bibtex ..... folder for all BIBTEX reference files
├── figures ..... folder for figures, my sources are SVG & PDF
├── publish ..... folder for published documents
│   ├── articles ..... ...such as articles
│   ├── books ..... ...or books
│   ├── lecture_notes ..... ...or lecture notes for computer science
│   └── presentations ..... ...or general presentations
└── repository ..... folder for the text content

```

4 User Manual

The **SKB** provides macros that simplify file handling and hide some L^AT_EX code (i.e. for figures) from the user, thus helping everyone to focus on the actual document one wants to write. There are a few macros, and they can be categorised as follows.

- Installation, rebuilt and configuration: this part deals with the installation of the package with your local L^AT_EX distribution, the rebuilt of the styles, classes and documentation (all of them are provided, but you never know, it might become useful) and the configuration of the **SKB** using configuration files and the macro `\skbconfig`.
- Files, figures and slides: the combination of `\skbheading` and `\skbinput` will process files and the document level of headings. The macro `\skbfigure` makes it easy to include figures in your document and the macro `\skbslide` helps with PDF slides and annotations (if you are not using a classic L^AT_EX solution such as the beamer package).
- Filenames, acronyms and references: here we deal with macros that provide access to the path and filenames the **SKB** maintains, plus loading acronym and reference databases.
- Other useful macros: there are some more macros that complete the **SKB**. There are little helpers for emphasising text, limiting the space between items in some list environments, putting acronyms into footnotes, filling meta information for PDF files and last not least macros that help dealing with optional and conditional text.

For the impatient, we start with a few examples. The first one shows how to use the **SKB** to produce a simple article. The second one explains how the documentation for the **SKB** is created using most of the **SKB** macros. Then we detail the usage of all the macros, following the above introduced categorisation.

4.1 Getting Started

4.1.1 The SKB Distribution

The **SKB** distribution that one can download from SourceForge or CTAN²⁰ contains the source files for the **SKB**, the generated classes and styles, the generated documentation and the source files for the user guide. The following example shows the structure and content of the **SKB** distribution.

²⁰the Comprehensive TeX Archive Network (CTAN)

[start folder]	
├ doc	<i>The generated PDFs and User Guide Sources</i>
│ └ [user-guide]	<i>Sources for the User Guide</i>
│ └ skb.pdf	<i>The generated Documentation</i>
│ └ skb-guide.pdf	<i>The User Guide only</i>
├ run	<i>The generated Class and Style Files</i>
│ └ skb.cfg	<i>The global Configuration File</i>
│ └ skb.sty	<i>The Style File</i>
│ └ *.cls	<i>The Class Files</i>
├ source	<i>The Source files</i>
│ └ skb.dtx	<i>Documented L^AT_EX Source File</i>
│ └ skb.ins	<i>The L^AT_EX Installer File</i>
│ └ *.txt	<i>Manifest, Licence, Todo List and History as plain Text</i>

4.1.2 Installation

There are two ways to install the **SKB**. The first option is have it automatically installed by your L^AT_EX distribution using T_EXLife or the **CTAN** archive²¹. The second option is a manual installation doing the following steps:

1. Go to your L^AT_EX distribution to the folder `tex/latex`.
2. Create a folder `skb`.
3. Copy all files from the directory `run` of this package to the newly created folder `tex/latex/skb`.
4. Update the filename database of your L^AT_EX distribution. Please see the manual or help files of your L^AT_EX distribution for details.

If you want copy the source and documentation files as well, then do the following steps. We start with the documentation:

1. Go to your L^AT_EX distribution to the folder `doc/latex`.
2. Create a folder `skb`.
3. Copy all files from the directory `doc` of this package to the newly created folder `doc/latex/skb`.

And now the source files of the **SKB**:

1. Go to your L^AT_EX distribution to the folder `source/latex`.
2. Create a folder `skb`.
3. Copy all files and directories from the directory `source` of this package to the newly created folder `source/latex/skb`.

Now you have installed the **SKB** and you are ready to use it.

4.1.3 Rebuild the SKB from Source

The **SKB** class and style files as well as the documentation can be rebuild from its sources very easily. The class and style files are part of the documented L^AT_EX sources in the file `source/skb.dtx` and the L^AT_EX installer (`source/skb.ins`) provides all necessary instructions. Simply follow the steps shown in the first part of the following example. All you have to do then is to copy the files created to your L^AT_EX distribution.

²¹Note: Version 0.5 of the **SKB** has been submitted to **CTAN** and is available at <http://www.ctan.org/tex-archive/macros/latex/contrib/skb/>. But it will take a while to reach all mirrors and even longer for TeX Live and automatic installation with your preferred T_EX distribution

```
## Build style and class files
$cd run
latex ../source/skb.ins
-> creates: skb.cfg, skb.sty and all cls files
```

The **SKB** documentation comes in several different ways. The file `source/skb.dtx` contains the documented source while the files in `doc/user-guide` can be used to generate the User Guide without source documentation, the **SKB** presentation (animated and not animated) and the lecture notes for the presentation.

When processing the file `source/skb.dtx`, the User Guide will automatically be included in the generated **PDF** if it is found in either of the directories `source/./doc/user-guide` (when using the **SKB** original distribution) or `source/./doc/latex/skb/user-guide` (when the **SKB** is already installed with your **L^AT_EX** distribution).

The following example shows how to generate the complete **SKB** documentation. Please note that the sequence is partially important, for instance the file `ug-slides-noanim` must be processed before the file `ug-slides-notes`.

```
$cd doc
$pdflatex ../source/skb.dtx
$bibtex skb
$pdflatex ../source/skb.dtx
$pdflatex ../source/skb.dtx

## Build User Guide
$cd doc
$pdflatex user-guide/user-guide
$bibtex user-guide
$pdflatex user-guide/user-guide
$pdflatex user-guide/user-guide

## Build Presentation with Animations
$cd doc
$pdflatex user-guide/ug-slides-anim
$bibtex user-guide
$pdflatex user-guide/ug-slides-anim
$pdflatex user-guide/ug-slides-anim

## Build Presentation without Animations
$pdflatex user-guide/ug-slides-noanim
$bibtex user-guide
$pdflatex user-guide/ug-slides-noanim
$pdflatex user-guide/ug-slides-noanim

## Build Notes for Presentation
$pdflatex user-guide/ug-slides-noanim
$bibtex user-guide
$pdflatex user-guide/ug-slides-noanim
$pdflatex user-guide/ug-slides-noanim
```

Please note that the **SKB** documentation is heavily using the **SKB** macros, so you will need to have the style and class files installed before you can rebuild the documentation.

4.1.4 Configuration: `skbconfig`

There are multiple options to configure the **SKB**. The following list contains all possible options starting with the least significant. That means that the higher priority settings, which overwrite other settings, will be listed at the bottom.

- Change the file `skb.sty` in your **L^AT_EX** distribution. This might require administrator (root) privileges. This option, while possible, is not recommended.
- Change the file `skb.cfg` in your **L^AT_EX** distribution. This might require administrator (root) privileges. This option is suitable for a system wide configuration, say on your own computer or laptop.

- Create a file `skblocal.cfg` in your personal L^AT_EX style/template directory. This will be the most convenient way to configure the SKB. Note: you might need to refresh the file database of your L^AT_EX distribution.
- Use `\skbconfig` in your documents.

If you chose option 1 we assume you know what you are doing. In case you chose options 2-3, you can use the macro `\skbconfig` to do the configuration for you. The macro comes with options for all possible settings of the SKB. Table 1 describes all options and shows their default value. Please note that the SKB can currently not handle inputs from directories outside the root hierarchy. However, one can call `\skbconfig` anytime to change the root directory, but be careful with potential side effects!.

Table 1: Options for `skbconfig`

Option	Description	Default
<code>root</code>	Sets the root path of the SKB. Everything that the SKB processes should be located below the root.	<code>/doc</code>
<code>pub</code>	Sets the path for the published documents.	<code>publish</code>
<code>rep</code>	Sets the path for the repository documents.	<code>/repository</code>
<code>fig</code>	Sets the path for figures.	<code>/figures</code>
<code>sli</code>	Sets the path for the slides.	<code>/transparencies</code>
<code>acr</code> , <code>acrfile</code>	The SKB uses the <code>acronym</code> package and these two macros detail the directory (<code>acr</code>) and the file (<code>acrfile</code>) where the acronyms can be found.	<code>acr:</code> <code>database/latex</code> <code>acrfile: acronym</code>
<code>bib</code> , <code>bibfile</code>	These two macros detail the directory (<code>bib</code>) and the main file (<code>bibfile</code>) where bibliographic information (BIB _T E _X database) can be found.	<code>bib:</code> <code>database/bibtex</code> <code>bibfile:</code> <code>bibliography</code>

The macro `\skbconfig` requires one argument, which describes where the configuration has been changed. This is helpful in combination with the macro `\skboptionsused` to trace configuration settings. For instance, in the files `skb.cfg` and `skblocal.cfg` we should use the respective filename. When changing configuration settings elsewhere, some other descriptive text should be useful.

The following code shows the example for `skbconfig`. The first one is the default content of the file `skb.cfg`. It basically sets all possible configuration options to their default value.

```
%default content of skb.cfg
\skbconfig[
  root=/doc,fig=figures,sli=slides
  acr=database/latex,acrfile=acronym,
  bib=database/bibtex,bibfile=bibliography,
  rep=repository,pub=publish
]{skb.cfg}

%using relative path for root and no directory structure
\skbconfig[
  root=.,rep=pub,fig=sli,
  acr=acrfile=acronym,
  bib=bibfile=bibliography
]{myfile.tex}
```

If you want to change the configuration settings for a single document without any directory structure, overwriting all default settings (from `skb.sty`, `skb.cfg` and `skblocal.cfg` and using the current relative path, you can use the second example shown above.

To trace the configuration settings, you can use `\skboptionsused`. Please see `###` for details on this macro.

4.1.5 Configuration: View Options Used

This macro will print out a warning including the currently used configuration information and the change list for each of them. For example, if the configuration for `root` has not been changed the output for `root` will be

```
- root [skb.sty]: /doc
```

but if the configuration for `fig` has been changed using `\skbconfig` to `graphics` the output for `root` will be

```
- fib [skb.sty, skbconfig]: graphics
```

This macro is automatically called at the end of processing.

When creating the documentation for the **SKB** by running `pdflatex skb.dtx`, the following output will be created:

```
Package skb Warning: Options last changed by: skb-presentation
(skb)      Change log:
(skb)      - root = skb.sty, ug-slides-noanim.tex
(skb)      - acr = skb.sty
(skb)      - acrfile = skb.sty
(skb)      - bib = skb.sty
(skb)      - bibfile = skb.sty
(skb)      - rep = skb.sty
(skb)      - pub = skb.sty, ug-slides-noanim.tex
(skb)      - fig = skb.sty
(skb)      - sli = skb.sty, skb-presentation
(skb)      Last set Path/File Options:
(skb)      - file root = user-guide/
(skb)      - path root = user-guide
(skb)      - file acr = user-guide/database/latex/acronym
(skb)      - file bib = user-guide/database/bibtex/bibliography
(skb)      - path bib = user-guide/database/bibtex
(skb)      - path rep = user-guide/repository/
(skb)      - path pub = user-guide//
(skb)      - path fig = user-guide/figures/
(skb)      - path sli = user-guide/slides/ .
```

The change log shows that all configuration options have been set by `skb.sty` and later by `skb.cfg`. Furthermore, the configuration option `root` has been changed by `skb.dtx`.

4.1.6 Creating a Directory Structure

The real power (and possibly madness) of the **SKB** comes with the separation of different parts of a document into different directory structures. For the user guide, we assume the following general directory structure.

```

[your repository root] ..... path to your repository, like /dev/documents
├── database ..... folder for all sorts of data for the repository
│   ├── latex ..... this is where LATEX data will be collected, such as our acronyms
│   └── bibtex ..... folder for all BIBTEX reference files
├── figures ..... folder for figures, my sources are SVG & PDF
├── publish ..... folder for published documents
│   ├── articles ..... ...such as articles
│   ├── books ..... ...or books
│   ├── lecture_notes ..... ...or lecture notes for computer science
│   └── presentations ..... ...or general presentations
└── repository ..... folder for the text content

```

To create this structure, go to the directory where you want to put all your documents, say `/doc`. Now create the folders `database`, `figures`, `publish` and `repository` and the respective sub-folders as shown above. Finally, configure the `SKB` by either editing one of the configuration files or adding the following line to all of your published documents (and of course change the text `myfile.tex` to something that tells you about the location of the configuration change):

```

\skbconfig[root=/doc,
  acr=database/latex,acrfile=acronym,
  bib=database/bibtex,bibfile=bibliography,
  rep=repository,pub=publish,
  fig=figures,sls=slides
]{myfile.tex}

```

The directory structures for the `publish` folder and the `repository` folder reflect different views to your document base. The `publish` folder contains documents that are published for a reason (i.e. articles, books, presentations, white papers, work in progress) while the `repository` folder contains content, most likely structured following a content-specific categorisation. The choice of how the directory structure looks like is yours, and of course you could also have multiple document directories with completely different structures, for instance one for computer science publications and one for a gardening book. The `SKB` does not set any limit, since it can be configured very flexibly to your needs (please see [subsubsection 4.1.4](#) for more details).

4.2 Files, Figures and Slides

4.2.1 Files and Headings

Just to remember: we have two different types of files in two different directory structures. The `repository` folder stores the content and the `publish` folder stores everything needed to produce complete documents. For the content in the `repository`, we mark headings with the macro `\skbheading`. This macro has no options and no arguments and is simply called with the text for the heading, as shown in the following example.

```

\skbheading{My Heading}

```

Leaving the argument empty will have the same effect as calling the original L^AT_EX macros directly with an empty argument.

The association of a L^AT_EX document level with the heading is then defined for the published documents (in the `publish` folder) using the macro `\skbinput`. This macro provides a number of options and requires one argument. The following examples show a few use cases for `\skbinput`. For all possible options, please see [Table 3](#)

```

1 \skbinput{myfile}
2 \skbinput[from=rep]{myfile}
3 \skbinput[from=pub]{myfile}
4 \skbinput[level=chapter]{myfile}
5 \skbinput[from=pub,level=chapter]{myfile}
6 \skbinput[from=pub]{test/myfile}

```

Table 3: Options for skbinput

Option	Description	Values
from	Set the directory from where the file should be loaded.	pub , rep , fig , sli
level	Set the document level to be used for the next occurrence of <code>\skbheading</code>	book , part , title , chapter , section , subsection , subsubsection

Let's start with the simplest form, one argument only shown in line 1. The macro will look for a file called `myfile.tex` in the root directory of the **SKB**. The file extension `.tex` is automatically added, and since we did not specify any special directory the root directory is used instead. If the file is not found, the macro will throw an error providing the full path and filename it did try to load.

Line 2 shows how we can load the file `myfile.tex` from the repository folder. As you can see, the option **from** is supplied with the argument **rep**, which in fact directs the macro to look for `myfile.tex` in the repository folder. Should the file be located in the folder for published documents, we simply change the **from** option to **pub** as shown in line 3.

If **from** is used and neither **pub** nor **rep** is given, the macro will throw an error.

To associate a document level for the heading, we can use the option **level** to define which level we want. This option understands all standard document levels from the memoir package: **book**, **part**, **title**, **chapter**, **section**, **subsection** and **subsubsection**. So, if we want to load `myfile.tex` as a chapter we simply invoke `\skbinput` as shown in line 4 of the example.

Since `myfile.tex` is part of the repository, we combine the two options **from** and **level** (see line 5). This call to `\input` will load `myfile.tex` from the repository and use `\chapter` for the heading found in that file. If `myfile.tex` is in a sub folder, we simply add that sub folder to the filename. An example is shown in line 6 assuming the the file is located in the repository sub-folder `examples`.

4.2.2 Figures

The classic way to add figures to your document is to have a **PDF** or **PNG** or **JPG**²² file ready, include it using `\includegraphics` while putting it into a box to resize it (i.e. to the width of the text in your document), putting this very box into a figure environment so that **L^AT_EX** can process list of figures etc. and of course adding `\label` and `\caption` to it. Here is some **L^AT_EX** example, which also uses the `center` environment:

```

\begin{figure}\begin{center}
  \resizebox{\textwidth}{!}{
    \includegraphics[width=\textwidth]{../figures/myfig}}
  \caption{My Figure}\label{myfig}
\end{center}\end{figure}

```

With the **SKB** macro `\skbfigure` things become a little bit simpler. It takes a number of options and one argument. The following code shows a number of examples for using this macro.

²²Joint Photographic Experts Group (**JPG**)

```

1 \skbfigure{myfig}
2 \skbfigure[figure,center]{myfig}
3 \skbfigure[figure,center,width=\textwidth]{myfig}
4 \skbfigure[figure,center,
5     caption=My Figure,label=myfig]{myfig}

```

Let's start with the easy usage, simply using the one argument to load a figure, as shown in line 1. This call will simply use `\includegraphics` and `\resizebox` to load the figure `myfig` from the figure directory, so we do not need to say `../figures` anymore. To use the figure and the center environment, we simply add two options requesting exactly that, as shown in line 2. In other words, using the option `figure` will put the `myfig` in a figure environment and using the option `center` will center the figure.

Similar for width and height information. Say the figure should be rescaled to the width of the text in your document you simply add width to the options, as shown in line 3. Use `height` for height or both options if required. Note that the width and the height are automatically applied to the `\resizebox` and `\includegraphics`. You can also add caption and label information using the respective options (lines 4 and 5). Now we will have the same result as the classic \LaTeX example. You can also add the required position for your figure, if using the figure environment applying the option `position` with the usual parameters, including `H` from the float environment.

Table 4: Options for `skbfigure`

Option	Description
<code>width</code>	Set the width to be used with <code>resizebox</code> and <code>includegraphics</code> .
<code>height</code>	Set the height to be used with <code>resizebox</code> and <code>includegraphics</code> .
<code>center</code>	Use center environment.
<code>figure</code>	Use figure environment.
<code>position</code>	The position to be used within figure environment. This option will be ignored if not combined with <code>figure</code> .
<code>caption</code>	The caption to be used. Ignored if the option <code>figure</code> is not used.
<code>label</code>	The label to be used. Ignored if the option <code>figure</code> is not used.
<code>multiinclude</code>	The label to be used. Ignored if the option <code>figure</code> is not used.

The last option for the macro `\skbfigure` is called `multiinclude`. It can be used with the beamer package to realise animations by loading a series of images and showing them in sequence with or without overlaying. If used, this option will overwrite all other options resulting in a simple call to `multiinclude` within a resised box. One can use all standard multiinclude parameters with `\skbfigure`, just omit the enclosing brackets. For instance, if you want to use multiinclude on the `myfig` with the options `<+->` call

```
\skbfigure[multiinclude=+-]{myfig}
```

The figure size will be automatically set to `\textwidth` and the height to `!`. The start of the multiinclude is fixed to be 0, the format is PDF. For more information on how to use multiinclude please refer to `mpmulti` and `beamer` packages.

4.2.3 Slides

This macro helps to create lecture notes (handouts) using PDF slides and \LaTeX notes without using the beamer package. The reason for adding this to the `SKB` was to integrate slides from

sources outside the L^AT_EX universe (i.e. Microsoft Powerpoint). Some of my presentations are done using Powerpoint, but for handouts I do prefer using L^AT_EX thus benefiting from many of the automated features it provides (references, acronyms). As a nice side effect, the output generated is scalable (assuming that the PDF sources of the slides contain scalable images rather than bitmaps, which can be easily realised using for instance Inkscape's EMF export within Microsoft Powerpoint slides).

The macro `\skbsslide` provides all means to include PDF slides with or without annotations, annotations only and it can load the annotations using different mechanisms. The macro offers two options to set the input path for the slides and the annotations: `slidefrom` and `notefrom`. If `slidefrom` is used, then the slide (PDF) file will be loaded from the requested path (`sli`, `rep` or `pub`). If `notefrom` is used, then the annotation (T_EX) file will be loaded from the requested path (`sli`, `rep` or `pub`). The default path for slides and annotations is the path for slides.

The third option `annotate` requests to load annotations. If not used, no annotations will be loaded. It can be used in combination with the two arguments to automated loading annotations.

The two arguments of this macro define the files for the slide and the annotation. They can be used as follows:

- Argument 1 is the slide to be loaded. If a name is given, we load the PDF using `\inputgraphics` with width being `\textwidth`. If no name is given, no slide will be loaded.
- Argument 2 is the file with the annotations in combination with the option `annotate`. If this option is not used then no annotations will be loaded. If the option is used and no name is given, then the annotation is loaded from a file with the same name as the slide plus the extension `.tex`. If this option is used and a name is given then this file will be loaded.

This provides the following combinations for `\skbsslide`

- Slide only: argument 1 has the name for the PDF, argument 2 is empty
- Annotation only: argument 1 is empty, argument 2 has the name for the T_EX file, option `annotate` used
- Slide with Annotation 1: argument 1 has the name for the PDF, argument 2 has the name for the T_EX file, option `annotate` used
- Slide with Annotation 2: argument 1 has the name for the PDF, argument is empty, option `annotate` used
- do nothing: leave both arguments empty

Some examples on how to use `\skbsslide`:

```

1 \skbsslide{myslides/slide1}{}
2 \skbsslide{myslides/slide2}{}\clearpage
3 \skbsslide[annotate]{myslides/slide3}{}
4 \skbsslide[annotate,notefrom=rep]
5   {myslides/theme1}{text/theme1}
6 \skbsslide[annotate,notefrom=rep,slidefrom=rep]
7   {text/theme2}{text/theme2}

```

In line 1 and 2 we load `myslides/slide1.pdf` and `myslides/slide2.pdf` from the default directory without any annotations and clear the page after that. In line 3 we load `myslides/slide2.pdf` and request this slide to be annotated without giving a specific file name, thus loading `myslides/slide3.tex`, both files from the default slides directory. In lines 4&5 we change the directory for the notes and request a particular file to be loaded, resulting in the slide loaded as `myslides/theme1.pdf` from the slides directory and the annotations loaded as `text/theme1.tex` from the repository. Finally, in lines 6&7 we change both folders to the repository, this loading `text/theme2.pdf` and `text/theme2.tex` from the repository.

The macro `\skbsslidecite` provides some simple means to add citations to annotated slides. It takes two arguments, the first one for the type of citation and the second one for the actual citation. Here a simple example:


```

1 \skbslidecite{Slide}{\cite{tanenbaum-andrew:book:2003}}
2 \skbslidecite{Notes}{\cite{standard:IETF:RFC:1155}}

```

The first line states that the slide contains material from a book of Tannenbaum and the second line states that the annotation contains material from an **IETF RFC**²³ standard documents ([**IETF1155-90**]). Since this macro is very simple, any content can be given for the two arguments.

4.3 Filenames, Acronyms and References

4.3.1 Path and File Names

The **SKB** provides a number of macros to directly create path and file names. Most of these macros are actually used within the **SKB**, but they might also be useful for users to access files without using the provided specialised macros (such as `\skbinput`). The following macros are provided:

- `\skbpathroot` – returns the set root path of the **SKB**.
- `\skbfileroot` – returns the set root path and adds `/#1`, i.e. the directory separator and the argument provided.
- `\skbfileacr` – returns the path (including root) and file name for the acronym database.
- `\skbfilebib` – returns the path (including root) and file name for the file that loads the reference database (**BIB_TE_X**).
- `\skbpathbib` – returns the path (including root) to the reference database.
- `\skbfilerep` – returns the path to the repository and adds `/#1`, i.e. the directory separator and the argument provided.
- `\skbfilepub` – returns the path to the folder with the published documents and adds `/#1`, i.e. the directory separator and the argument provided.
- `\skbfilefig` – returns the path to the figure folder and adds `/#1`, i.e. the directory separator and the argument provided.
- `\skbfilesli` – returns the path to the slide folder and adds `/#1`, i.e. the directory separator and the argument provided.

4.3.2 Loading Acronyms and Bibliographic Information

These two macros can be used to load the acronym database (`\skbacronyms`) and the references (`\skbbibtex`). Both macros behave identical: they use `\InputIfFileExists` to check whether the acronym or bibtex file exists. If so, they simply input the file. If not, they use `\PackageError` to throw an error with a help message, showing the requested database file to input. One should use `\skbacronyms` at the place in the document where the list of acronyms should be printed and `\skbbibtex` at the beginning of the document to load the bibliographic information.

4.4 Other useful Macros

4.4.1 Emphasising Text

Highlighting or emphasising text is an important aspect of many technical documents. One can use **L_AT_EX** macros directly to set text in italic or bold. This has the disadvantage that there is no meaningful information given as on why that text is treated in a special way. Furthermore, when the editor requires to change certain highlights, it will be very difficult to go through a large document and figure out which text is to be changed.

²³Request for Comment (**RFC**)

To prevent that from happening, one can use L^AT_EX macros to actually distinguish between different highlighted text. A simple start is provided by the **SKB**. It is simply because, at the moment, it only supports three different ways and no further meaningful information. But it is a start.

The macro `\skbem` comes with three different options. The option `bold` will set the text given in the argument in bold face. Similar, the option `italic` will set it italic. Last not least, the option `code` will use another **SKB** macro (`\skbcode`) for typesetting the argument text. The following code shows some examples for the macro:

```
Use \cmd{\skbem} to produce \skbem[bold]{bold},
\skbem[italic]{italic} or \skbem[code]{type writer} text.

The example above shows the macro \skbem[code]{skbem} with
the option \skbem[italic]{bold} and \skbem[bold]{italic}.
```

And here the final type setting of that example:

Use `\skbem` to produce **bold**, *italic* or `type writer` text.

The example above shows the macro `skbem` with the option *bold* and **italic**.

This macro `\skbcode` is a facade for calling the macro `lstinline` from the `listing` package with a basic style that uses `type writer` font (`ttfamily`).

4.4.2 Environments for lists and enumerates

These two environments mimic the macro `\tightlists` from the `memoir` package. It might be useful when not using `memoir` to minimise the margin between items in lists (`itemize`) and enumerations (`enumerate`).

Both environments do the following:

- Store current value of `\parskip` and `\itemsep`.
- Set `\parskip` and `\itemsep` to 0cm.
- Use the original environments (`itemize` for `skbnotelist` and `enumerate` for `skbnotenum`)
- Set `\parskip` and `\itemsep` back to their original value.

Here is an example using first the classic list environment (`itemize`) and then the **SKB** macro `skbnotelist` ²⁴ ²⁵ :

- Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.
- Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.
- Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur.
- Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Now list with `\skbnotelist`:

- Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.
- Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.
- Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur.
- Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Note: both macros will only change the margins of the `memoir` package is not loaded!

²⁴For those who are interested, the ‘Lorem Ipsum’ is the standard phrase commonly used since the 1500s.

²⁵The following examples might have no effect on annotated slides...

4.4.3 Macros for PDF Info

The macro `\skbtitle` will set the title to be used for PDF info. The default for the title is an empty string.

The macro `\skbauthor` will set the author information to be used for PDF info. The default for the author is an empty string.

The macro `\skbsubject` will set the subject information to be used for PDF info. The default for the subject is an empty string.

The macro `\skbkeywords` will set the keywords to be used for PDF info. The default for the keywords is an empty string.

The macro `\skbpdfinfo` will call the macro `\pdfinfo` to set the meta information in the created PDF output file. The **SKB** automatically calls this macro just before finishing the process of the main document, using the information provided by the above described macros. Furthermore, the date of the PDF file will be set.

4.4.4 Listings Styles and Support

The **SKB** comes with a few predefined styles for the listing package. Most of them use type writer font in scriptsize, arrange a grey box around the listing and set the keywords to Blue4.

- generic – for any generic listing without specifying a language and no line numbers.
- genericLN – same as generic, just with line number in the left side, which means allowing extra space left to the listing box.
- gentab – almost the same as generic, but without definitions for frame and numbers, which seem to collide with some table environments.
- genericLNspecial – same as genericLN, just with a lighter grey for the box.
- beamer-example – style designed for examples in beamer frames.
- beamer-exampleLN – same as beamer-example, just with line numbers on the left, which means allowing extra space left to the listing box.
- javaCode – generic style plus language Java.

There is also one macro supported, which sets the listing style back to normal, i.e. after changing it in the text. Some macros in the **SKB** make use of this. All that `\lstdefinestyle` does is setting the basic style back to type writer font.

4.4.5 Optional Text – Versions and Optional

The **SKB** provides two means to include text and other L^AT_EX commands on an optional basis. They are pre-configured and will be automatically set/unset according to the three main document types the **SKB** supports:

- text – is equivalent to any classic text document, for instance an article or a book.
- slide – is used to identify slides, for instance beamer frames.
- note – is used to identify lecture notes or handouts, in essence annotated slides (frames).
- anim – for beamer frames, used for text with animation activated.
- noanim – for beamer frames, used for text with animation deactivated.
- memoir – used for documents that include the memoir package.

We use the packages versions and optional and support both. The main difference is that with versions one has to use `\begin` and `\end` while with optional one can use more than one of the above introduced types. The macros for provided for optional text are:

- `\skbmodetext` and options using `text` – will be valid if neither `beamer` nor `beamerarticle` is loaded (normal text).
- `\skbmodeslide` and options using `slide` – will be valid if the `beamer` package is loaded (slides).
- `\skbmodenote` and options using `note` – will be valid if the `beamerarticle` package is loaded (annotated slides).
- `\skbmodeanim` and options using `anim` – will be valid if the `beamer` package is loaded and the `SKB` is loaded with the argument `beameranim`
- `\skbmodennoanim` and options using `noanim` – will be valid if the `beamer` package is loaded and the `SKB` is loaded with the argument `beameranoanim`
- `\skbmodememoir` and options using `memoir` – will be valid if the `memoir` package is loaded

The following code shows a few examples on how to use the optional text.

5 Examples

A Simple Article

Take the article that describes the state of the art in protocols. Remember, we have all the contents for that in our `repository` directory. We go the directory that has the published articles `published/articles` and create a new file say `protocols.tex`.

```
\documentclass{skbarticle}

\begin{document}
  \author{Sven van der Meer}
  \title{Protocols, Formats and Communication Services}
  \maketitle
  \tableofcontents*
  \bigskip

  \skbinput[from=rep]{sota/protocols}

  \section{Introduction}
    \skbinput[from=rep,level=subsection]
      {sota/protocols/data_encoding}
    \skbinput[from=rep,level=subsection]
      {sota/protocols/message-formates}
    \skbinput[from=rep,level=subsection]
      {sota/protocols/protocols}
    \skbinput[from=rep,level=subsection]
      {sota/protocols/protocol-services}

  \skbinput[from=rep,level=section]{sdo/omg/corba-giop}
  \skbinput[from=rep,level=section]{sdo/ietf/snmp-protocol}
  \skbinput[from=rep,level=section]{sdo/itu/x700-cmip}
  \skbinput[from=rep,level=section]{sdo/w3c/http}

\end{document}
\endinput
```

The article uses the class `skbarticle`. That class will load the `SKB` package and the `memoir` class and do all settings we need. It prepares the title page and prints the table of contents like any other \LaTeX article. It uses `\skbinput` to load files from the repository. The first one is loaded without requesting a level. In other words, there is some text right at the beginning of our article, without any special heading, like an abstract.

Then we do start the section 'Introduction' and collect a few files with their heading categorised as sub-sections. Reading the directory and file names, we can already guess what the introduction will be doing: it introduces general protocol concepts with regard to data encoding, protocol message formats, protocols themselves and protocol services. The last block loads four files with

headings categorised as sections. Using the directory names, we see that the remaining article describes the protocols The General Inter-ORB Protocol (**GIOP**) defined by the **OMG**, Simple Network Management Protocol (**SNMP**) by the **IETF**, Common Management Information Protocol (**CMIP**) by the International Telecommunication Unit (**ITU**) and finally Hyper Text Transfer Protocol (**HTTP**) by the World Wide Web Consortium (**W3C**).

Finally, we load acronyms and bibliography and finishing the article. This example will create a table of contents similar to this:

1	Introduction	1
1.1	Data Encoding	2
1.2	Message Formats	5
1.3	Protocols	7
1.4	Protocol Services	9
2	General Inter-ORB Protocol	10
3	Simple Network Management Protocol	13
4	Common Management Information Protocol	15
5	Hypertext Transport Protocol	18

Job done. Now we can use \LaTeX or $\text{PDF-}\text{\LaTeX}$ to compile our article.

Acronyms

ANTLR	ANother Tool for Language Recognition
CMIP	Common Management Information Protocol
CTAN	the Comprehensive TeX Archive Network
GIOP	The General Inter-ORB Protocol
HTML	Hyper Text Markup Language
HTTP	Hyper Text Transfer Protocol
IEEE	Institute of Electrical and Electronic Engineers
IETF	Internet Engineering Task Force
ITU	International Telecommunication Unit
JPG	Joint Photographic Experts Group
LNCS	Lecture Notes in Computer Science
MS	Microsoft
OMG	Object Management Group
PDF	Portable Document Format
PHP	PHP Hypertext Preprocessor
PNG	Portable Network Graphics
RFC	Request for Comment
SDO	Standard Defining Organisation
SKB	Sven's Knowledge Base
SNMP	Simple Network Management Protocol
SQL	Structured Query Language
SVG	Scalable Vector Graphics
USB	Universal Serial Bus
W3C	World Wide Web Consortium

References

- [IETF1155-90] Internet Engineering Task Force. *Structure and identification of management information for TCP/IP-based internets*. Request for Comments 1155. (Standard, STD0016). 1990. URL: <http://www.ietf.org/rfc/rfc1155.txt>.