DSpace AddOn and Component Management System

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Richard Jones, April 2006

what and why

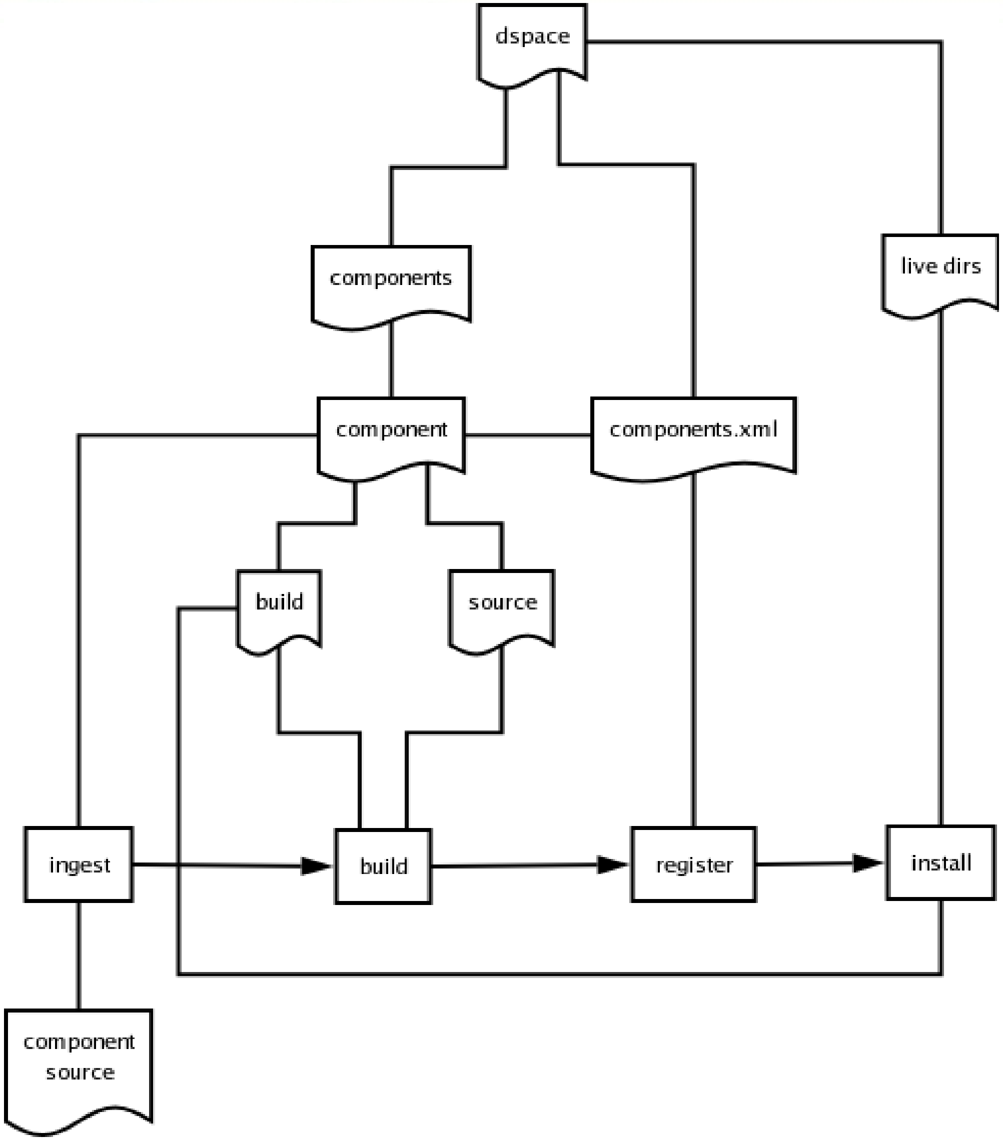
- What is an addon or component?
  - a third-party feature
  - a localisation
  - an official DSpace component
- why do we need them?
  - ease creation of new tools
  - improve modularity and plugability of DSpace
  - allow for multiple alternatives for repositories
  - ease management of customised instances

Aspects of the AddOn Mech

- New build/install/update process
- Component management system
- Component versioning
- Skeleton component for quick build of new tools

Note: this is a prototype, and feedback is welcome and encouraged

Prototype build process



Component Management

- Component Versioning
  - useful for managing schema and code installation
  - useful for managing updating and rollback
- Installation order
  - some aspects of the code overwrite the installed components before them
  - important for schema, UI components, and configuration
- Component Registry
  - components.xml holds info on registered components, their version, and installation order
  - database registers which components (and versions) have installed schemas

Challenges: configuration

- XML file merging solution adapted from another Open Source project (Grouper)
  - successful with dspace-web.xml
  - TODO for dspace-tags.tld, input-forms.xml and any other XML configuration files
- Properties files
  - use of Java Properties class
  - working for dspace.cfg and Messages.properties
  - TODO for non-unique key property files (e.g. dstat.cfg) and multiple Messages_X.properties

Challenges: to patch or not to patch

- Each component has own JAR file
- Encourage the use of good modular programming rather than overwriting other code
- Encourage the use of configuration based alternatives (e.g. using the PluginManager)
- Allow DSpace to move slowly in the right direction rather than using a quick fix which may be damaging in the long term
- Allow compilation of subsequent components against installed ones by placing the JAR in the live library immediately

Challenges: JSPs

- Original method: JSPs in jsp/local are copied over their counterparts in build/jsp during build
- Doing this with components is highly sensitive to installation order:
  - components can override default DSpace JSPs
  - components can override eachothers' JSPs
  - institutions will have their own localisations
  - Therefore, risk of conflicts (no solution yet)
- Component Manager controls installation order
  - DSpace first, components next, localisations last
  - This is not enforced, only recommended

Challenges: other UI issues

- Common UI components
  - navigation: lots of tools will add navigation items, so cannot rely on JSP overwriting
  - style sheets: tools should add their own styles, not override the default.
- Possible solutions:
  - XML driven navigation in prototype. Will this make things easier? How do we add new items at install?
  - Similar solution for stylesheets?
- Future: What impact will Manakin have on this process?

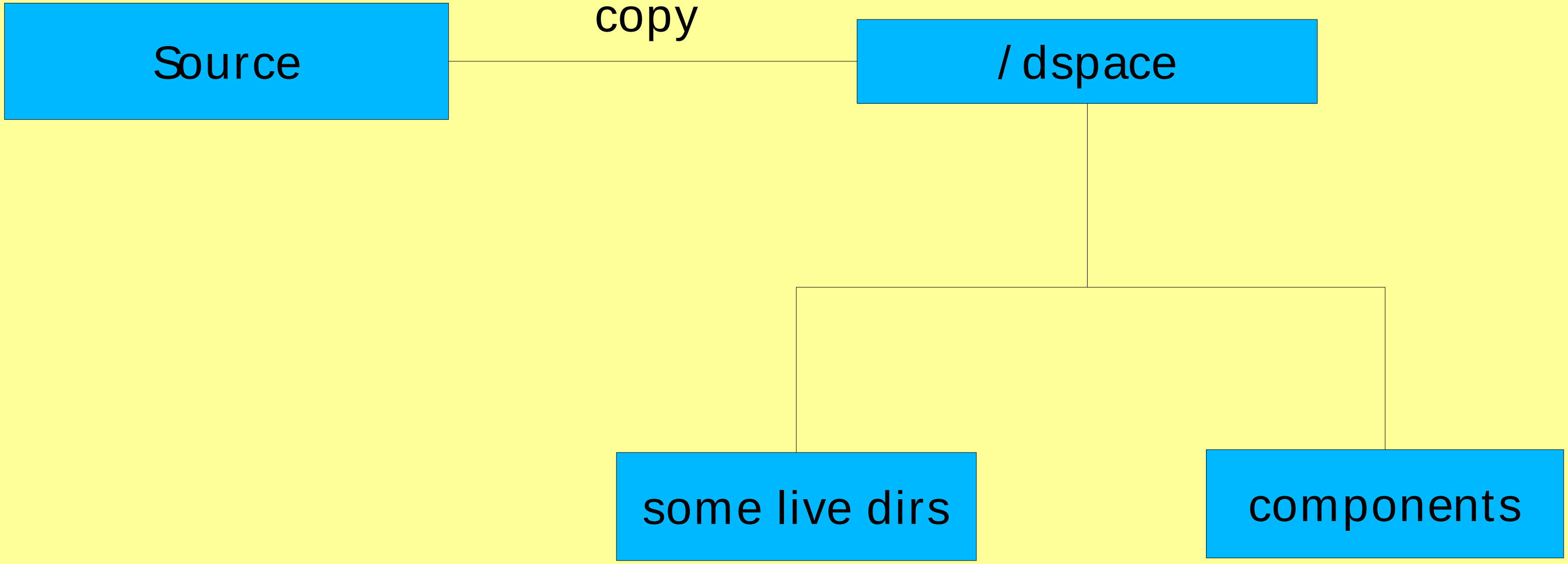
Challenges: database management

- Updating from an arbitrary point to the latest
- Single schema files vs multiple schema files
- registering schema versions with the Component Manager
- registry loaders (e.g. Bitstream Formats, Metadata Registry, and now Metadata Schema Registry)
- schema files should not load any actual data
- database destroy scripts required
  - uninstallation process is not yet clear

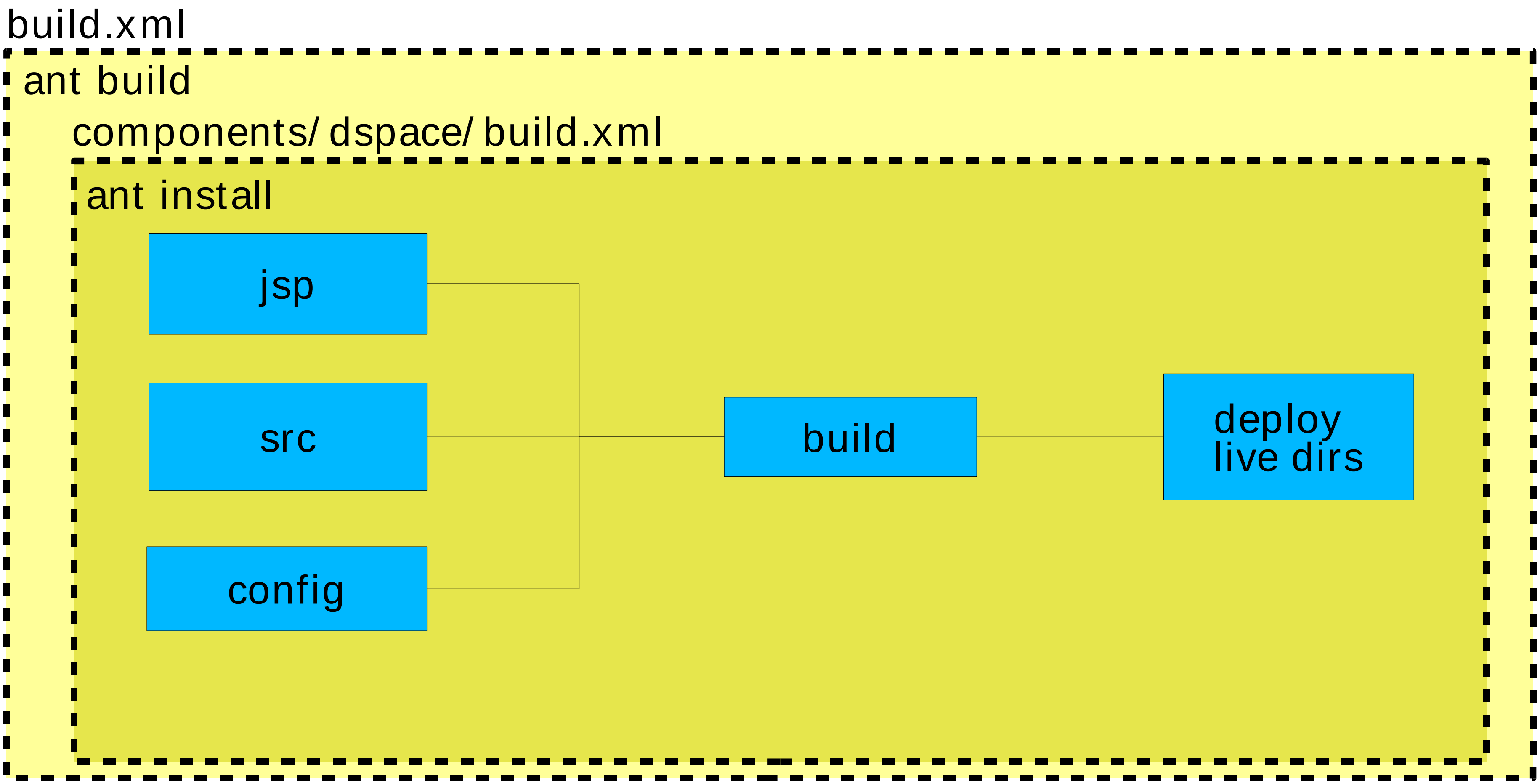
Default Installation Walkthrough

build.xml

ant -Ddir=/dspace init



Default Installation Walkthrough



build.xml

ant build

components/dspace/build.xml

ant install

jsp

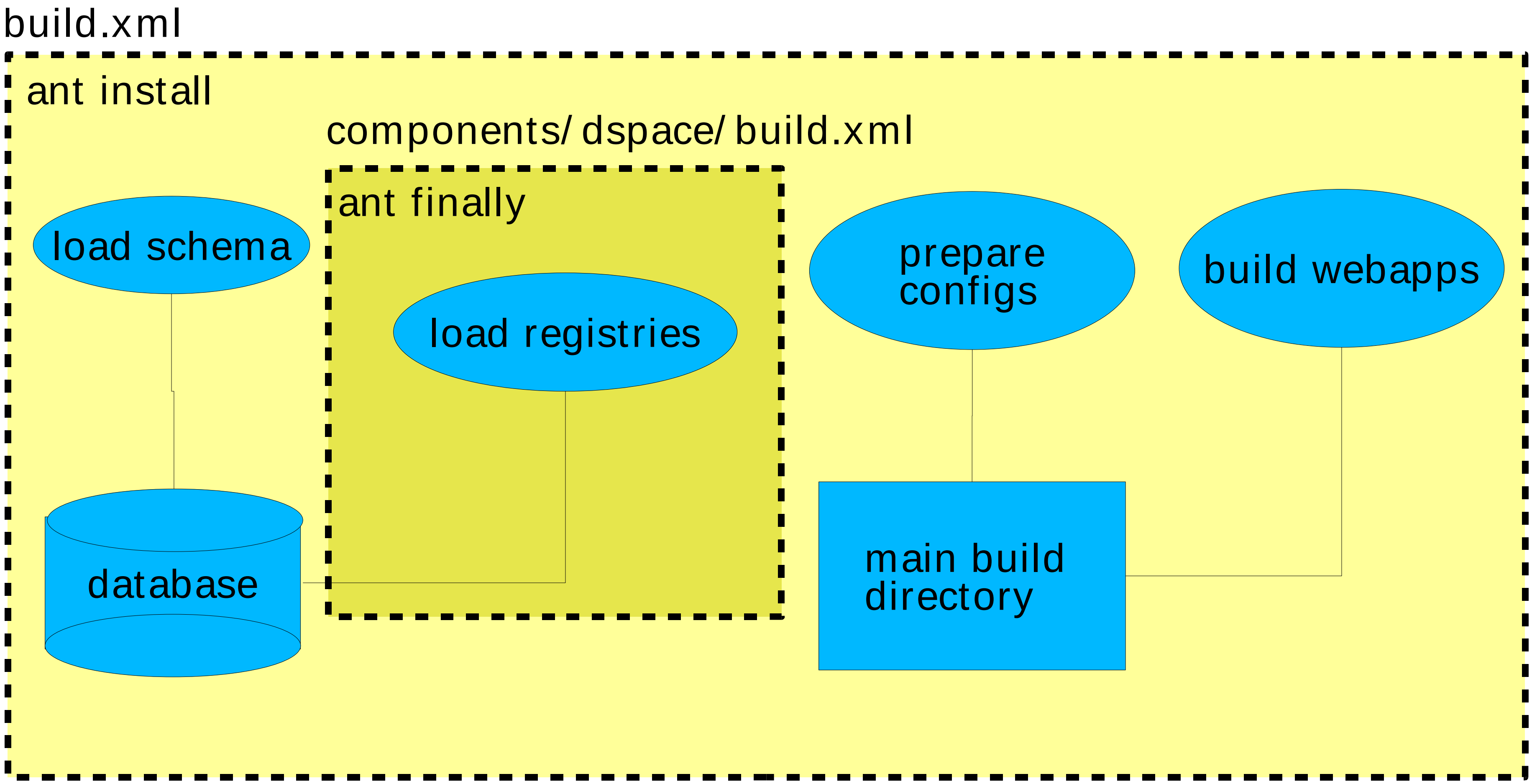
src

config

build

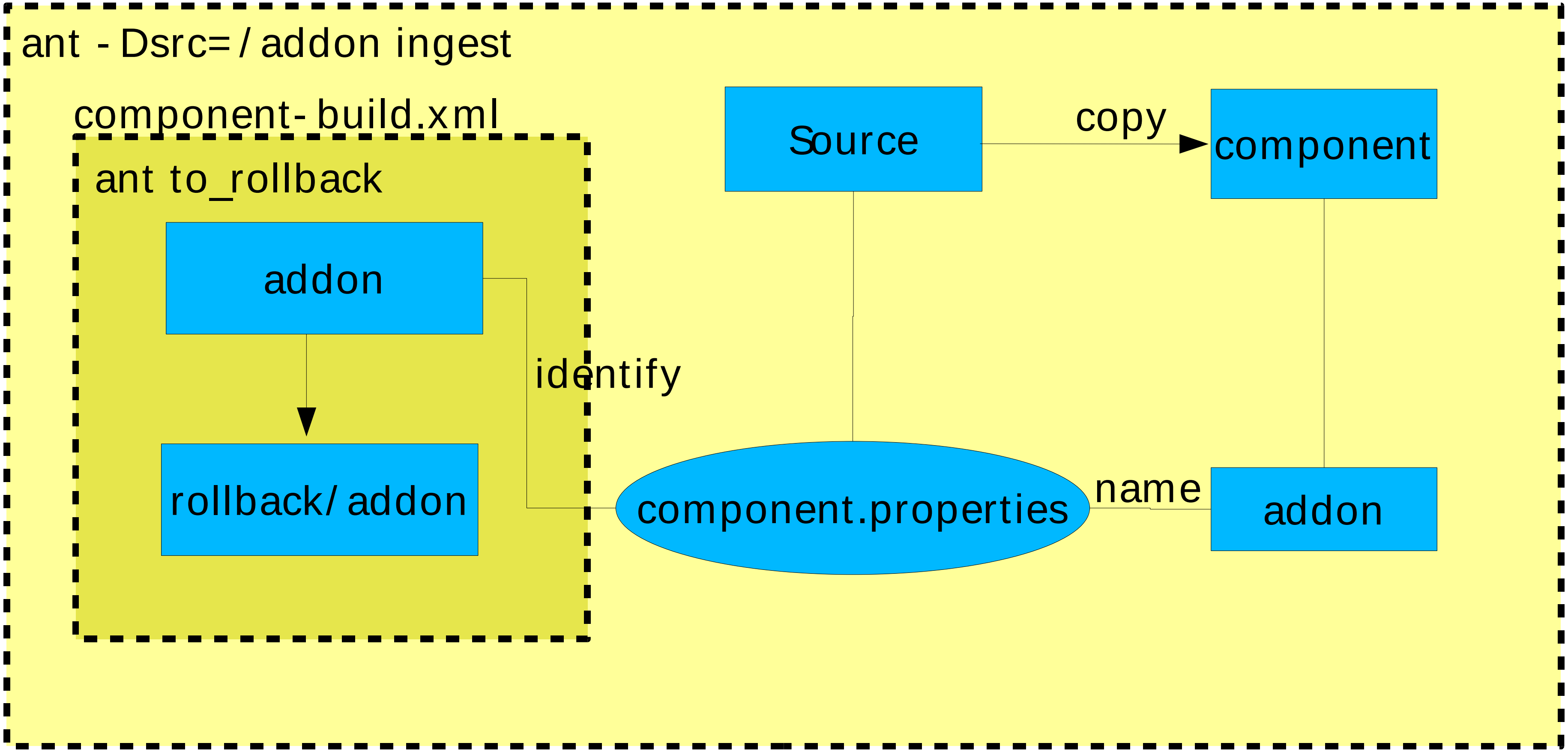
deploy
live dirs

Default Installation Walkthrough

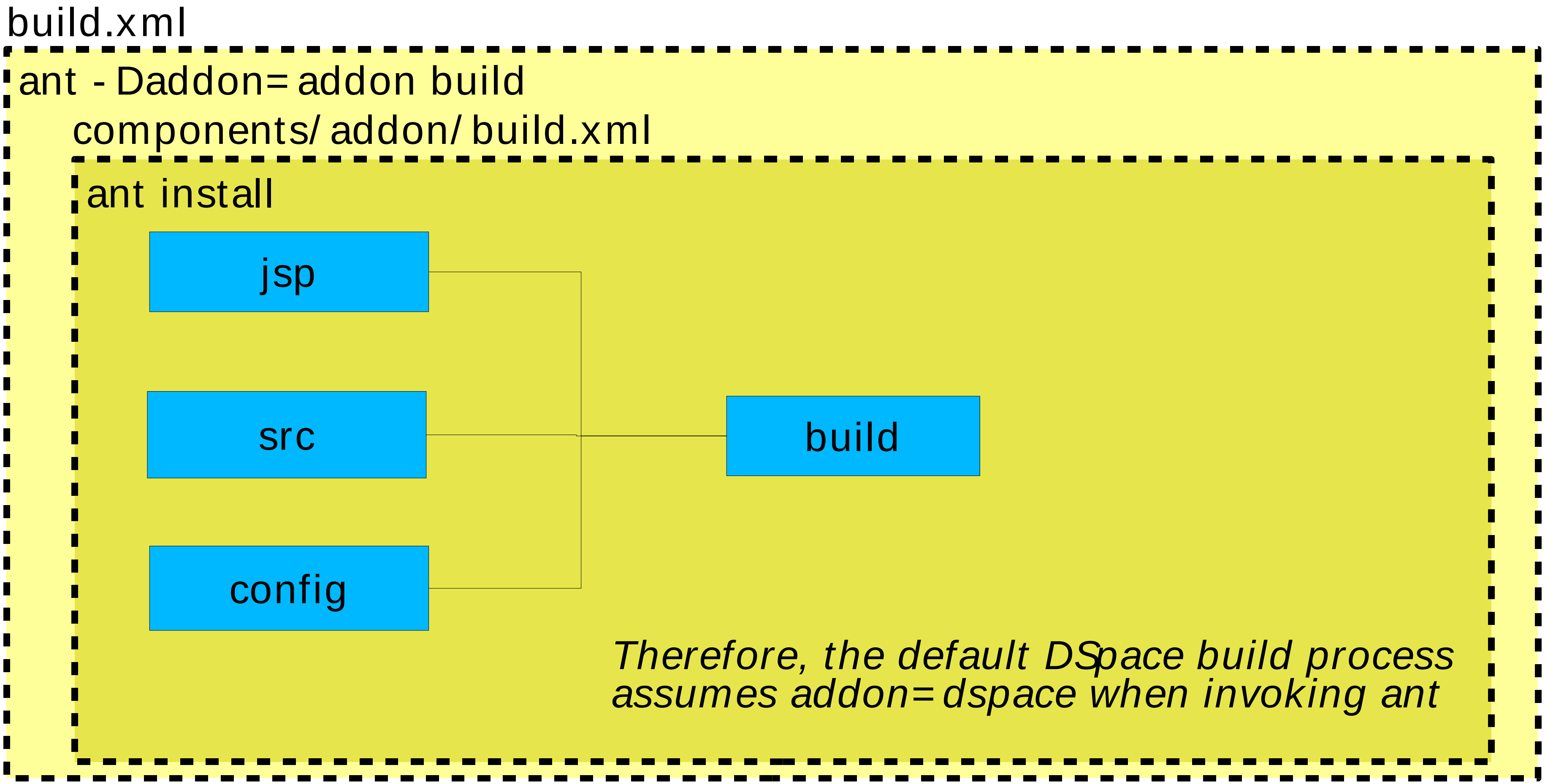


Component Installation Walkthrough

build.xml



Component Installation Walkthrough



build.xml

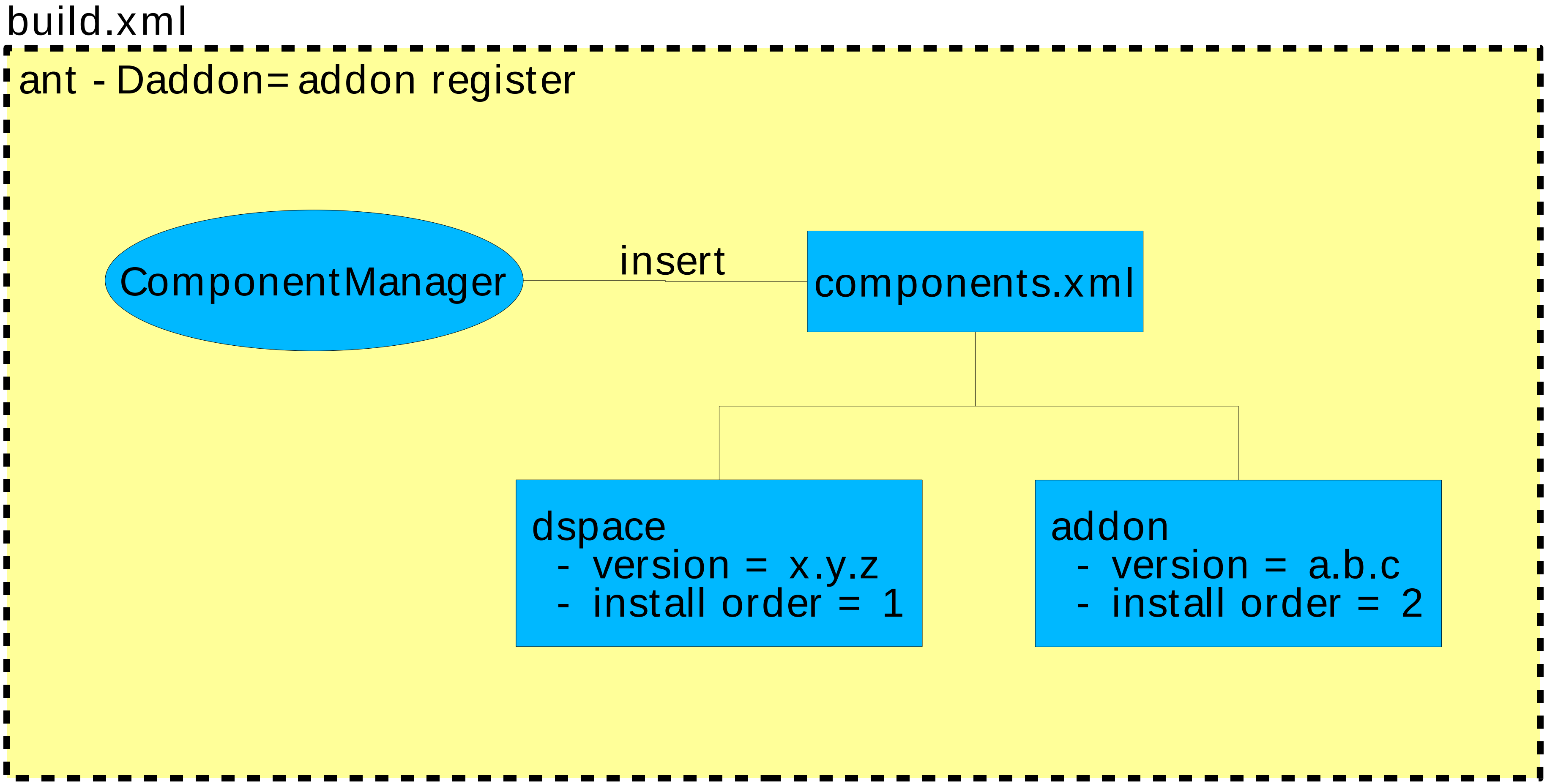
ant -Daddon=addon build

components/addon/build.xml

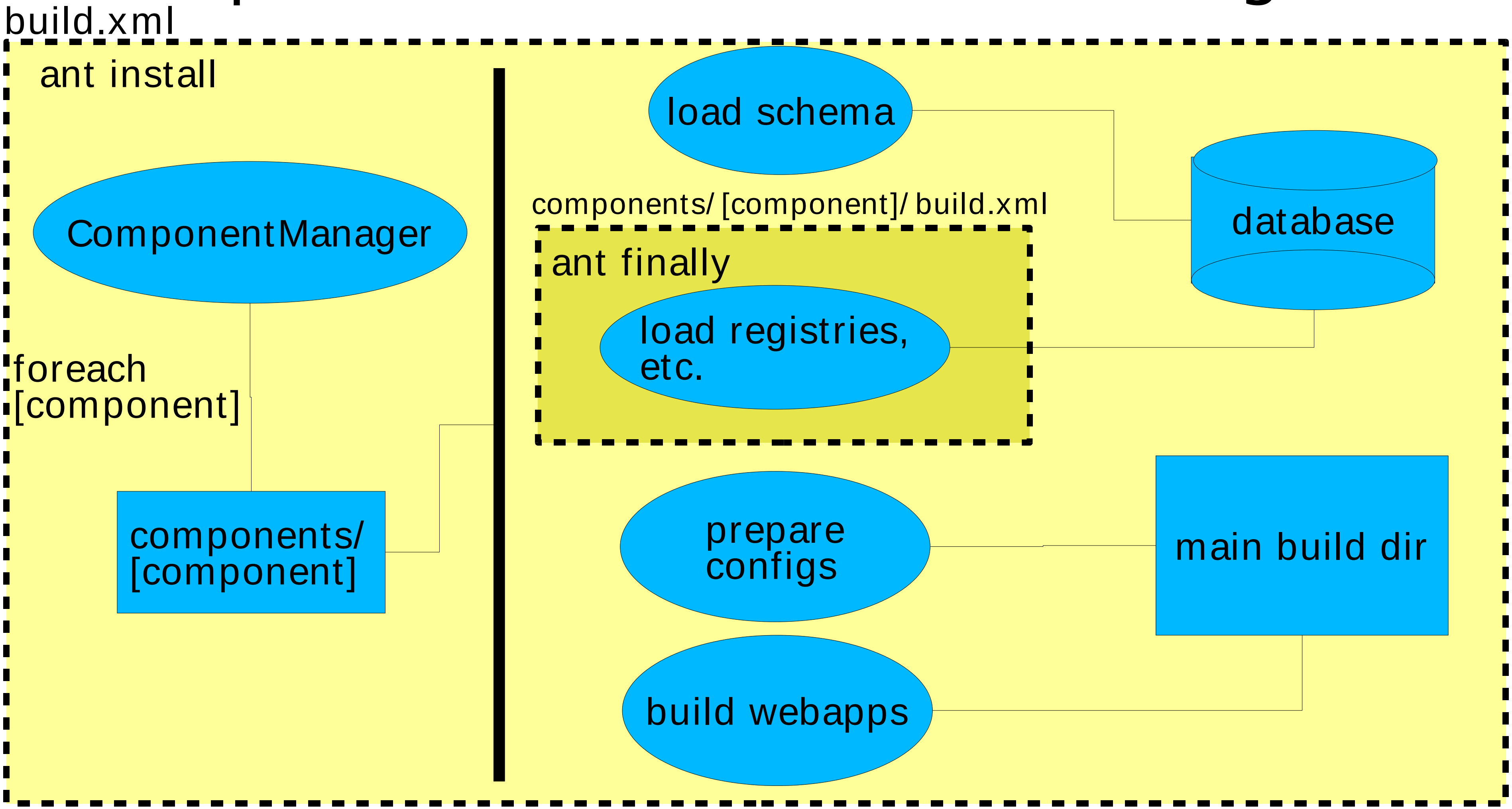
ant install

Therefore, the default DSpace build process assumes addon=dspace when invoking ant

Component Installation Walkthrough



Component Installation Walkthrough



Component Skeleton

• build/	*created when necessary*
• config/	
– language-packs/	*Messages.properties*
– registries/	*e.g. dublin-core-types.xml*
– dspace.cfg	*component config options*
• etc/	
– schema.sql	*db schema create*
– schema-destroy.sql	*db schema destroy*
– dspace-web.xml	*servlet mappings, etc…*
• jsp/	
• lib/	*for additional JARs etc…*
• src/	*component source tree*
• build.xml	*component build file (templated)*
• component.properties	*component properties file*

Component Skeleton build file

- Primary Targets (called by the master build file):
  - install – compile the sources into the addon build directory *(implemented)*
  - finally – finish up the installation. For example, load the database registries. *(unimplemented)*
- Secondary Targets (called by the primary targets)
  - build_structure – create the build directory sub-structure *(implemented)*
  - compile – compile the source code into the build directory *(implemented)*
  - make_jar – make the source code into a JAR file *(implemented)*
  - configs – move the configs into the right places *(basic case implemented)*
  - jsps – put the jsps in the build directory *(implemented)*

Component properties

```
# Required properties:

# The name of the component.  This will be the directory in which it is stored
# in the DSpace source tree, so please ensure that it is compliant with
# directory name standards.  Ideally only use alphanumeric characters (avoid
# spaces).  This does not have to be the name of the component as it is commonly
# known, it is for system use only.

component.name = addon

# the version of the component.  Components are required to use at most a
# three level version numbering scheme.  The versions should be expressed
# as numbers only, in the usual order.  This is to allow comparisons of which
# is most recent in the version chain by the DSpace system

component.version.major = 1
component.version.minor = 0
component.version.subminor = 0
```

towards a first Stable Release

- More XML merging (tags and possibly input forms)
- Reference Implementations
- Testing
  - making and installing addons
  - upgrading from the current DSpace
- Tidying up
  - better Exception handling
- Documentation
  - inline installation help documentation
  - developer documentation

beyond a Stable Release

- Translated message file merging
- Component dependency warnings/resolution
- Component version rollback
- Multiple webapps
- Modular documentation management
- Anything else that is suggested and useful ...
- Your contribution ... please get involved

References

- AddOn Mech wiki page:
  - http://wiki.dspace.org/AddOnMechanism
- Manakin XML UI project
  - http://wiki.dspace.org/Manakin
- Grouper (XML merging code)
  - http://middleware.internet2.edu/dir/groups/grouper/

Thanks for listening

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