

ns-3 app store overview

August 11, 2017

The screenshot shows the ns-3 App Store website. The browser address bar displays 'apps.nsnam.org'. The header features the 'ns-3 App Store' logo, a 'Submit an App' button, a search bar with the text 'Search the App Store', and a 'Sign In' link.

All Apps

Categories

- visualization
- routing
- TCP
- mobility
- propagation
- utility
- Wi-Fi
- topology
- LTE
- IoT
- security
- animation
- statistics
- IPv6
- traffic generators
- AQM
- vehicular

Newest Releases

[Get Started with the App Store »](#)

NYU WIRELESS **5G mmWave**
ns-3 module for simulating mmWave-based cellular systems

Routes mobility model
Mobility models integrated with Google Maps/Directions API

dgt **WOSS module**
World Ocean Satellite System (WOSS) support

QUIC Protocol **QUIC for ns-3**
QUIC protocol model for ns-3

IEEE 802.11ah
Support for IEEE 802.11ah

REM queue disc
Random Exponential Marking (REM) for ns-3

[more newest releases »](#)

Terminology

- An ns-3 '**module**' is a collection of models built as a shared library and linked with ns-3 main programs
 - In ns-3, these are organized as directories under the 'src/' directory; e.g. 'olsr' and 'wifi'
- Starting with the ns-3.27 release, contributed, third-party modules may be provided and published to the ns-3 community
 - The '**app store**' is the front-end Web site that enables third-party module providers to publish and advertise their modules
 - The 'bake' build tool provides a command-line tool to download and build the module, and any dependencies, based on an XML module description called a '**modulespec**'

Conceptual overview



Benefits of a federated development environment:

1) Allow users to tailor their ns-3 installation (reduce build and linking of unnecessary modules)

2) Allow developers to make releases of their modules independently of the ns-3 release cycle

Source code releases

- ns-3 still relies on source archive releases
 - May move also to binary package releases in the future, but that is outside of this scope of this presentation
- Future 'ns-allinone-3.xx.tar.bz2' releases will contain the source code of fewer modules
 - However, the 'bake' tool will be populated with modulespec files tested to work with the release
 - bake will also be able to update its modulespecs
- We may create additional larger ns-allinone releases analogous to 'spins' of a desktop distro (outside the scope of this presentation)
 - e.g. 'ns-allinone-3.xx-wireless' or 'ns-allinone-3.xx-lte'

User workflow

- 1) User downloads an ns-3 release
- 2) User learns about additional modules of interest
 - by perusing the app store, or via the 'bake' CLI
- 3) User visits the app store to learn more about the module
 - prerequisites or installation instructions
 - how to report bugs/issues
 - where to find module documentation
 - etc.

Example

- ▮ Front page lists available modules in order of newest to oldest (other search criteria available including by name, by tag (e.g. MANET), etc.)
- ▮ Visit <http://ns-apps.ee.washington.edu> for our prototype (work in progress)



Example (cont.)

- User interested in 'Epidemic Routing' can find additional information on the module page:

The screenshot shows the 'Epidemic Routing' module page in the ns-3 App Store. The page has a dark header with the 'ns-3 App Store' logo, a search bar, and a 'Sign In' button. Below the header, there's a link to 'Go back to home'. The main title is 'Epidemic Routing' with a subtitle 'Epidemic Routing for Partially-Connected Ad Hoc Networks'. There are five empty star icons and a green circular icon with a question mark. Below this, there are four tabs: 'Details', 'Release History', 'Instructions', and 'Maintenance'. A red oval highlights these tabs, with a red arrow pointing to it from the text 'Tabs for details (screenshots), release history, installation instructions, and maintenance status'. Below the tabs, the text 'Epidemic Routing for Partially-Connected Ad Hoc Networks' is repeated. Under 'Authors:', there is a list with 'Mohammed Alenazi (University of Kansas)'. On the right side, there is a 'Download' button with a download icon. Below it, it says 'Version 1.1', 'Released July 25, 2017', and 'Works with ns-3.27'. At the bottom right, there is a 'RESOURCES' section with links: 'Ask a question', 'Report a Bug', 'Search posts', 'Website', and 'Code Repository'. A red arrow points from the text 'Resources menu for website, repository, issue tracker (etc.) links, and a Download button' to the 'Download' button and the 'RESOURCES' section.

ns-3 App Store

Search the App Store Sign In

Go back to home

Epidemic Routing
Epidemic Routing for Partially-Connected Ad Hoc Networks

☆☆☆☆☆ (0)

Details Release History Instructions Maintenance

Epidemic Routing for Partially-Connected Ad Hoc Networks

Authors:

- Mohammed Alenazi (University of Kansas)

Download

Version 1.1
Released July 25, 2017
Works with ns-3.27

RESOURCES

- Ask a question
- Report a Bug
- Search posts
- Website
- Code Repository

Download options

Depending on the module, many options may exist

- 1) Use 'bake' to configure, download, and build the module
- 2) The author may have made available a downloadable archive, to be unpacked in the ns-3 contrib/ directory
- 3) The user may 'git clone' the source code into the ns-3 contrib/ directory

The module author will need to decide what he or she wants to be linked as the primary Download option

Release options

- Module authors may make releases, based on their own numbering system
 - e.g. epidemic-routing 1.0, 1.1, etc.
- A new modulespec should be generated and uploaded to the app store for each release
- bake should fetch and build the module version compatible with the user's ns-3 release

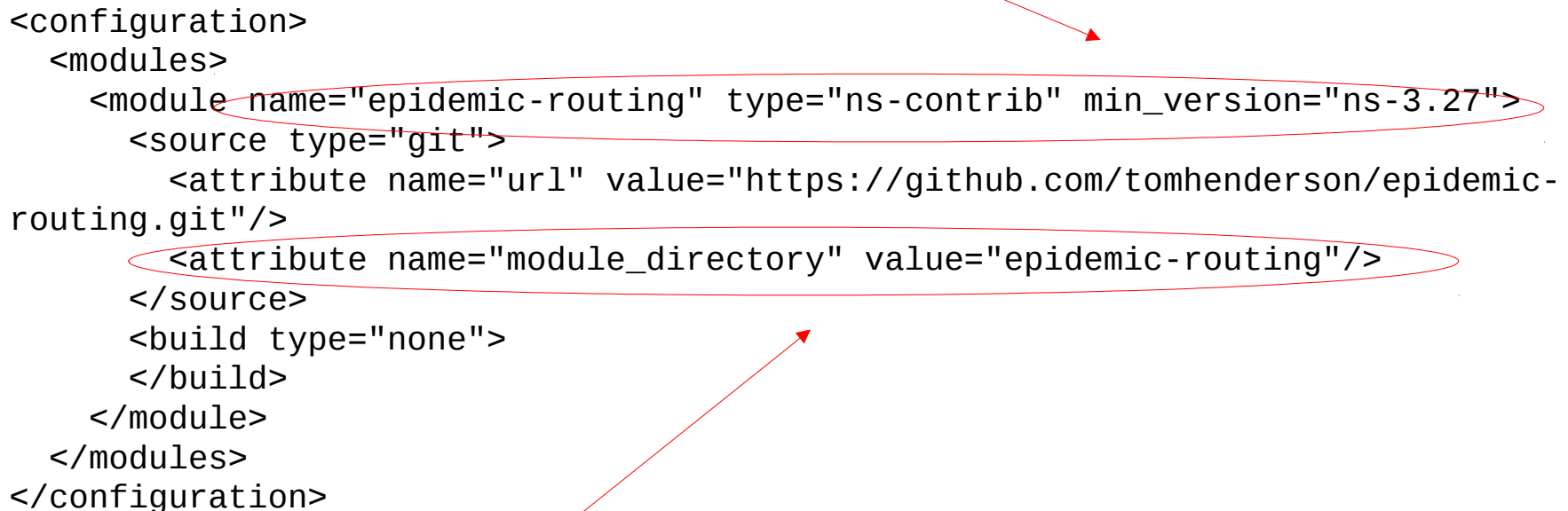
Module code organization

- Module authors need to provide their module in a form that is downloadable
- Module authors should use a publicly available service (github, gitlab, bitbucket) or web site (for a compressed archive)
- the repository should have the directory structure of an existing ns-3 module
 - e.g. 'src/', 'test/', 'doc/' etc. directories
- Module authors must provide a modulespec file for each release
- ns-3's 'create-module.py' will be modified to help guide prospective authors with a **skeleton**

modulespec example

key attributes are 'name', 'type' of 'ns-contrib', and min_version for minimum ns-3 version

```
<configuration>
  <modules>
    <module name="epidemic-routing" type="ns-contrib" min_version="ns-3.27">
      <source type="git">
        <attribute name="url" value="https://github.com/tomhenderson/epidemic-
routing.git"/>
        <attribute name="module_directory" value="epidemic-routing"/>
      </source>
      <build type="none">
      </build>
    </module>
  </modules>
</configuration>
```



module_directory attribute declares how the module will be named under the contrib/ directory

Installation options

- **Manual:** Based on information learned from app store Installation tab, user downloads or clones source code directly into ns-3 contrib/ or src/ directory, installs necessary prerequisites, etc.
- **Semi-automatic:** User downloads the modulespec XML file and places it in his or her bake/contrib directory, and uses bake to install it to ns-3
- **Automatic:** User uses bake at the command line to discover changes
 - e.g. 'bake update' will pull modulespecs from the app store, and then 'bake list available' will display available packages
 - This requires bake extensions and is outside the scope of the GSoC project

module version

- Modules should have a version number according to arbitrary convention
 - e.g. '0.1', '3.27.1', '0.1.rc', 'dev', 'devel'
 - each version should have its own modulespec file named 'modulename-version.xml'
 - each modulespec should be self-contained with all non-ns-3 prerequisites listed
- Module versions can be tied to ns-3 versions
 - e.g. '0.1' is compatible with ns-3.27
 - the 'min_version' attribute declares this