

DTN Network Management - Collaborators
Meeting Notes for Technical Exchange Meeting
Friday, January 8, 2010
8:30 - 14:30 EST (13:30 - 19:30 UTC)

A Technical Exchange Meeting was held on Friday, January 8, 2010 at Ohio University in Athens, Ohio. Remote attendance was available via teleconference and WebEx.

These notes are to document that meeting and have been generated by Will Ivancic.

See DTNREG wiki for additional information and slides.

<http://www.dtnrg.org/wiki/DtnBone/JanNetManMeeting>

Participants (I may have missed some or included some that really were not on)

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- BBN – Cambridge (Josh Bers, John Zinky)
- Ohio University (Hans Kruse, Shawn Ostermann, Gregg Campbell, Clark Gilbert, David Young)
- NASA Glenn (Will Ivancic, Alan Hylton, Jim McKim, Denis Iannicca, Joseph Ishac)
- N4C (Elwyn Davies, Avri Dori)
- Viagenie (Marc Blanchet)
- Applied Physics Lab (Ed Birrane)

Agenda: Start Time is 8:30 EST (13:30 UTC)

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- 1) N4C-lessons learned from field trials and desired network management features/capabilities
- 2) Monitoring
 - 2a) DTN-2
 - 2a1) Local Management in DTN2 (discussion and demonstration)- McKim
 - 2a2) Extending DTN2 local management to Remote Management - McKim
 - 2b) ION Network Management
 - 2b1) Local Management in ION - Ohio University
 - 2b2) Remote Management in ION - Ohio University
- 3) Configuration Management - APL
(ION "load and go", others ...)
 - Automated Fault Detection (APL)
- 4) CCSDS Green Book on Network Management for Space-based systems
 - (For non-CCSDS people, a Green Book is equivalent to an Informational RFC)
- 5) DTNbone Discussions
 - DTN disconnection topology
 - Dynamic routing
 - Security Test Keys???
 - Test and debug tools (e.g. Wireshark and others)
- 6) Common API

-- Network Performance and Troubleshooting Utilities
(DTNtraceroute, DTNperf, heartbeat, etc...)

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1) N4C-Avri Dori and Elwyn Davis provides some lessons learned from field trials and desired network management features/capabilities. N4C is very interested in getting some of the Code NASA and Ohio University (OU) are working and begin playing with this.

2) Monitoring and Configuration

Ohio University (OU) and NASA Glenn Research Center (GRC) have strategically decided to split Network Management implementations such that OU works on ION while GRC works DTN2

Jim McKim present current state of Network Management for DTN2 (Slides on line)

- Local management is via SNMP agent.
- BBN MIP document used as starting point. Jim fixed and added items to MIB.
- A new command was added to the User Interface to enable “get” commands.
- To generate DTN bundles, the JavaScript Object Notation (JSON) is used. JSON is a lightweight data-interchange format. It is easy for humans to read and write. It is easy for machines to parse and generate and it is readily available.
 - Bundles can be a bit large, but we can adopt OU “schema” concepts later that basically are pre-configured compression as JSON bundles allow early flexibility.

(Side Note: Meeting discussion resulted in the notion that it is better early on to be less concerned about bandwidth utilization and more concerned about getting tools out to enable the community to begin figuring out how to do DTN Network Management.)

- Need to figure out the best way to distribute the code.

Greg Campbell and Gilbert Clark presented OU’s approach to network management – slides on line. The basic idea is to have a SNMP gateway. SNMP is exchanged between the management system and the gateway. The gateway responds in real time to the SNMP with cached data and obtains the data via bundling. Ohio University personnel are developing a network management protocol call DING. An Internet Draft should be out in the next few months. Detail are in the online slides.

3) Configuration Management - APL

Ed Birrane briefly discussed APL’s approach to network management base on Dr. Robert Coles work with MANETs and netconf.

- 4) CCSDS Green Book on Network Management for Space-based systems
- (For non-CCSDS people, a Green Book is equivalent to an Informational RFC)
 - Ed Birrane went over the outline and some detail of what he would like in a CCSDS Green Book. Idea is to Network Management is rather and requires its own document
 - The outline will be made available and put online on the wiki
- 5) Common API

Gilbert Clark provided a short presentation on the SimpleBP (SBP) API is designed to provide a simple way to code applications which use DTN. In addition, a tic-tac-toe game was demonstrated that was written using the SBP. The SBP code is available here:

<https://ion.ocp.ohiou.edu/content/sbpapi-065-alpha-1>

<https://ion.ocp.ohiou.edu/content/sbp-api-documentation>

I will see if the tic-tac-toe game could be released as well.

6) DTNbone Discussions

- Ohio University utilized work started by others (BBN?) and completed bundling extensions for wireshark and was able to get the implementation into the latest release. Thus, if you download the latest release of wireshark, you will be able to use this to debug bundles.
- DTN disconnection topology
 - Both OU and GRC agreed that we need some permanently always accessible Disconnected Networks for network management. It was decided that GRC and OU would put nearly identical network together, on running DTN2 and the other ION.
 - Three base network types were identified
 - One with the first bundle agent reachable in the order of minutes and the bundle agent behind the first reachable on the order of tens of minutes.
 - A second with the first bundle agent reachable in the order of tens of minutes and the bundle agent behind the first reachable on the order of minutes.
 - A third reachable by multiple paths thereby testing dynamic routing.
 - The conceptual network layout is posted on the DTNRG wiki
 - OU and GRC will implement these in virtual machines with the gateway portions and the network management portions reachable via the Open Internet.

Submitted by Will Ivancic 01/12/2010