Postellation:
A DTN Implementation

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Plan

- Key Design Considerations
- Features
- HTTP over DTN
- DTN News Service
- Virtual DTN Cloud and demo
Postellation

• <post>ellation:
  – Postal service is store and forward “network”
  – Has optional “custody”

• post<ellation>:
  – Constellation => network
Key Design Considerations

• **Lean** Bundle protocol implementation
  → good for embedded systems

• **Smart** HTTP proxy
  → enabling Web/SOA application developers to use DTN “transparently”

• **Easy** deployment of DTN networks
  → enabling a much larger number of end-users to use DTN, develop a community, applications, ...
Features

• written in lean and “vanilla” C → for embedded systems

• Portable code: compiles/runs/tested on:
  – Linux (kernel 2.6+)
  – *BSD, MacOSX (Leopard, Snow Leopard)
  – Windows (from XP to W7)

• Bundle Protocol (RFC5050)

• Convergence Layers:
  – UDP, TCP and TCP-TLS

• Transport: IPv4 and IPv6
Features (cont.)

- Included applications:
  - dtnping/dtnpong
  - dtnsend/dtnrecv
  - HTTP/HTTPS Proxy
  - RSS news service delivery, such as NASA news over DTN!
- Packagers for Windows, MacOSX and Linux
- Automated registration of nodes to our DTN node:
  - *No configuration to do.*
  - *And you are connected to the DTN network*
HTTP Proxy

• Support:
  – http
  – https
  – or any http tunnels

• Smarts to facilitate transparency of Web applications over DTN

• Implemented as a local proxy
  – For bundling HTTP requests into Bundles

• With a remote proxy
  – For unbundling HTTP requests and sending them over IP
Interoperability

- Tested with IBR DTN implementation in the middle of the Postellation DTN Cloud

- Next steps: test against DTN2 and ION
Demonstration (1)

HTTP to DTN Proxy

Browser

HTTP

HTTP Server

reeves.viagenie.ca

HTTP

Bundles Over TCPcl

DTN to HTTP Proxy

bpd

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Demonstration (2)

HTTP to DTN Proxy
bpd

HTTP Server

HTTP to DTN Proxy
bpd

HTTP

Client node

Internet

Browser

HTTP

HTTP Server

reeves.viagenie.ca

DTN to HTTP Proxy
bpd

Bundles/UDPcl
1.3 sec delay

moon.viagenie.ca

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Opening for Beta Testers

- Implementation:
  - has been tested in production work for weeks
  - connected automatically to the DTN node and HTTP proxy
- If you would like to test it out, go to:
  - [http://postellation.viagenie.ca](http://postellation.viagenie.ca) (via IPv4, IPv6 or DTN)
  - After downloading, uncompress, then run the “start” program. This will start Bundle Protocol, HTTP proxy and registers the node to the DTN network.
  - After running it, you can also subscribe to our RSS News Service Delivery over DTN, to receive your NASA news over DTN!
Conclusion

• **Lean** BP implementation → good for embedded systems

• Ported to most OS

• **Smart** http/https proxy for easy application deployment

• **Easy** deployment by automating registration and configuration

• Available for beta testing: http://postellation.viagenie.ca
Questions?

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This presentation: http://www.viagenie.ca/publications/

References

- http://postellation.viagenie.ca