Summer 2010

Initial, Preliminary, Draft, Partial
(you get the idea:-)
Results from the TCD/Intel/Tannak
Summer 2010 Trial

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N4C Project Meeting
Poznan, October 2010
Contents

- Test Setup
- Test Execution
- Results so far
- Tentative Conclusions
Test Setup: Network
Test Setup: Applications

- E-mail via BP
  - Including mail account provisioning
  - Otherwise mostly same as 2009 but with 6 message store replicas!
- HTTP URL fetching application
  - Almost same as 2009
- Pushed web content
  - List of URLs configured in TCD pushed daily to all routers
Test Execution

- http://down.dsg.cs.tcd.ie/s10inf/
- Eoin, Kerry, Shane, Stephen, Stefan and Alex all visited during July
  - Got lots of good help from LTU (Samo, Fritte, John) and Tannak (Susanne, Karin)
  - Thanks!
- Elwyn, Karl-Johann and Arne-Wilhelm visited (Stalo) in August
The Good News

- Village router hardware worked really well
  - Lovely power management
- WRAP-based mule worked
  - But battery backup apparently didn't
- OSBridge gateways sort-of worked
  - Crappy bandwidth and gw-1 died half way through
- Applications all worked, with a few bug fixes along the way
- DTN worked
  - 3 DTN2 bugs seen (1 found, 1 workaround, 1 tbd)
- Basic log data = 13GB (compressed)
- Order of magnitude more of everything than 2009
  - 9449 application layer bundles vs. 127
  - 45 “remote” days vs. 3
  - ...
Initial Results

- Power
- DHCPACKs
- Contacts
- DTN2 dtnd daemon start/exits
- Bundles
- (Mail, Web and DTN apps TBD)
- (Numeric analysis TBD)
Contacts (~9084)
More on Bundles

- 9449 bundle submissions
  - Details of the path for all 9449 at: http://down.dsg.cs.tcd.ie/summer10/bundles
- 40794 bundles delivered
  - Many multiple-deliveries
- 162764 unique bundle IDs seen
  - Above plus custody acks, status reports and Norut/Folly bundles
- ~318 bundles involving Folly/Norut EIDs
- We had a bundle storm!
An Interesting Bundle

Bundle 332057648008 from router-1:maileync to basil:maileync size 133120 sent 2010-07-19:12:17:28
A Naughty Bundle
Bundle Storm

1: Cause:

- Largish queues due to flood routing on basil
- Large queue => long time between events
- Registration expired between delivery decision and actual delivery
  - Low probability with small queues
- Bug in delivery code didn't delete bundle after delivery in just this case, or maybe DTN2 flooding just doesn't delete it
- This bundle requested a status report, so it was generated
- GOTO 1
Bug

BundleDaemon::event_handlers_completed(BundleEvent* event)
{
    log_debug("event handlers completed for (%p) %s", event, event->type_str());

    /**
     * Once bundle reception, transmission or delivery has been
     * processed by the router, check to see if it's still needed,
     * otherwise we delete it.
     */
    BundleRef bundle("BundleDaemon::event_handlers_completed");
    if (event->type_ == BUNDLE_RECEIVED) {
        bundle = ((BundleReceivedEvent*)event)->bundleref_;
    } else if (event->type_ == BUNDLE_TRANSMITTED) {
        bundle = ((BundleTransmittedEvent*)event)->bundleref_;
    } else if (event->type_ == BUNDLE_DELIVERED) {
        bundle = ((BundleTransmittedEvent*)event)->bundleref_;
    }
    if (bundle != NULL) {
        try_to_delete(bundle);
    }
}
Work Around

• Put “sybil” in place that only flooded to gateways and no-one else
• Reduced queue sizes
• No further storms AFAIK
Tentative Conclusions

• Mixed results: great router h/w; maybe fewer real users than hoped-for
  • Application layer analysis real soon now
  • Lack of local directory-type services noticed
  • Facebook (kids) and banking (adults) most common request
• BP performance and routing interesting
  • Data should show way to possible improvements in static/flood routing
• Contact graph should be of use to DTN researchers generally
• Storm figures will set record!