Sharing the dream

The consensual hallucination offered by the Bundle Protocol

Lloyd Wood, Daniel Floreani, Peter Holliday, Wes Eddy

Universal understandings

"**Cyberspace.** A consensual hallucination experienced daily by billions of legitimate operators, in every nation"
-- William Gibson, *Neuromancer*.
                    Hugo, Nebula, Philip K. Dick awards.

IP is now universally adopted.
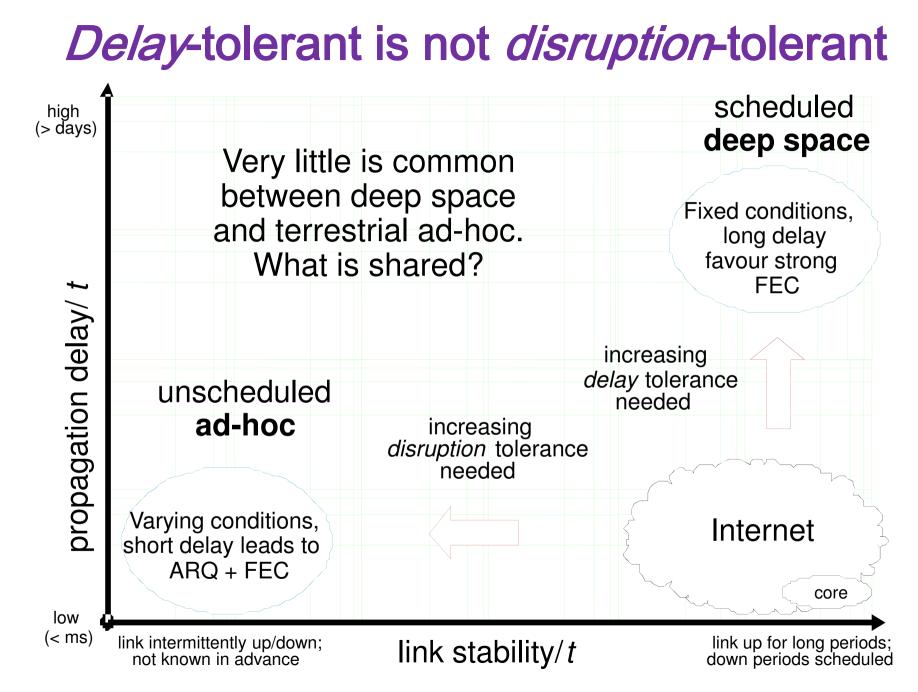IP provides us with that shared hallucination. (As does the web.)

The bundle protocol is not yet shared

Possible user communities testing bundling:

- Civil space satellites for the "Interplanetary Internet," where bundling began before undergoing scope creep.

- Military (via DARPA)

- Reindeer herders (social networking)

Do these communities need to talk to each other? (They do need to talk to the Internet.)

What is common, other than the need to talk to the Internet? What needs are shared?

Delay-tolerant is not *disruption*-tolerant

Very little is common
between deep space
and terrestrial ad-hoc.
What is shared?

propagation delay/ t (y-axis)

high
(> days)

low
(< ms)

scheduled
deep space

Fixed conditions,
long delay
favour strong
FEC

increasing
delay tolerance
needed

unscheduled
ad-hoc

increasing
disruption tolerance
needed

Varying conditions,
short delay leads to
ARQ + FEC

Internet

core

link intermittently up/down;
not known in advance

link stability/ t

link up for long periods;
down periods scheduled

What does the Bundle Protocol add?

- IP gave the ability to share computing resources, via telnet and ftp, way back when.

- telnet and ftp became the 'killer apps' that helped drive adoption of IP. (Now, the web helps drive adoption.)

- What is the 'killer app' for the Bundle Protocol?

- Given that sensor networks have different requirements leading to very different implementations, what is gained by doing the work (time, cost, engineering) to support the Bundle Protocol?

- **These are questions that need to be asked.**

Questions?
Thank you