

Open Internet & Transparency Policy in practice

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Open Internet

Internet is *network of networks*

- Distributed end-to-end control. Multi-stakeholder decision-making.
- Technical: connectivity, interoperability, e2e QoE
- Economic: complex, asymmetric/imperfect information game
 - Externalities, Large sunk/fixed/shared costs, Increasing returns to scale,...
 - Social & private incentives diverge : tussle over shared costs, value
 - Collective innovation & learning

Open Internet

- For competition across value chain, innovation, end-user choice
- Universal access to essential infrastructure (“Internet is new PSTN”)
- Sustainable investment

Dynamic evolving **shared infrastructure (and expectations)**

- Mobile/fixed convergence, Everything-on-IP, IoT, BigData, Clouds, ...
- Fluid industry structure/value chains. Expanded end-user control.
- Light-handed regulation (rely on markets whenever possible...)

Open Internet & Transparency Policy

Policymaking challenge: better *evidence based decision-making*

- Who? Consumers, Edge-providers, ISPs, regulators
- What decisions?
 - Consumers: what service to buy? how to use?
 - Edge-providers: how to design BB apps/content?
 - ISPs: what QoS and pricing for BB?
 - Regulators: promote universal access, competition, investment, innovation

But.... Decision makers often lack the necessary information

- Performance: QoE (end-to-end) = $f(\text{QoS along path})$
- Network Management Practices (by everyone who impacts path)
- Stakeholder bargaining positions and strategies
 - ISPs, Edge Providers, End-users, and Regulators
 - Forecasts of tech, market, and policy trends
 - Who knows what? What are pay-off/response functions of agents?

Disclosure & Transparency Policies

Information Economics 101: decision-making is costly, strategic

- Direct costs: data acquisition, distribution, management
- Indirect costs: private info is strategic asset, shifting asymmetric information alters market payoffs (competitive advantage, effectiveness of regulatory constraints, price discrimination, etc.)

Policy *must* induce *incentive-compatible information sharing*

- Incentives depend on context, so D&T is context dependent (who/what/how)
- Trust an issue \Leftrightarrow need multiple perspectives
- Uncertainty/Imperfect info \Leftrightarrow collective learning (innovation)
- Robustness \Leftrightarrow (partial) independence of (info) failure modes

Open Internet Order *Disclosure & Transparency* Rules

“A person engaged in the provision of broadband Internet access service shall publicly disclose accurate information regarding the **network management practices, performance, and commercial terms** of its broadband Internet access services sufficient for consumers to make informed choices regarding use of such services and for content, application, service, and device providers to develop, market, and maintain Internet offerings” (FCC Feb2015 OIO, paragraphs 23-24, 109, 154-175)

- Assert authority & mandate public **transparency reports**
 - Categories of info, clarifications & guidance, e.g., “performance” disclosure should include “packet loss”
 - Leave to ISPs to determine metrics & precise content
 - Reserve right to require additional mandates
- **Measuring Broadband America (MBA)**: FCC’s voluntary measurement platform.
 - FCC publishes MBA reports (trust, but verify)
 - Safe Harbor (para 176-181) if ISP participates in MBA
 - Only measures access of large ISPs, limited measurement nodes
- OIO **Bright Line** and **General Conduct** Standards
 - ISPs prohibited from traffic blocking, throttling, or paid prioritization
 - Prohibited from business conduct that would unreasonably discriminate

Disclosure & Transparency – a tool box is needed

- **Direct Policies: ISP transparency & FCC MBA reports**
- **Indirect Policies: Industry defines QoS metrics, Safe harbor**
- **Mechanisms**
 - **Industry Standards** (metrics & measurement, reporting, bus practices)
 - New communication channels: e.g., [Net.info](#)
 - Empower **edge-based measurement**
 - multiple perspectives enable cross-validation
 - flexible and timely responses (complements MBA)
 - part of “trust but verify”
- **Information Sharing via D&T is dynamic, evolving process**
 - Informs specific decisions & evolving market expectations
 - Q: Packet Loss metrics? ⇔ Q: QoE needed for universal BB?
- **Understand multi-layered framework**
 - To anticipate & interpret measurements *and* role in decision-making
 - Aid in design of measurement platforms

References

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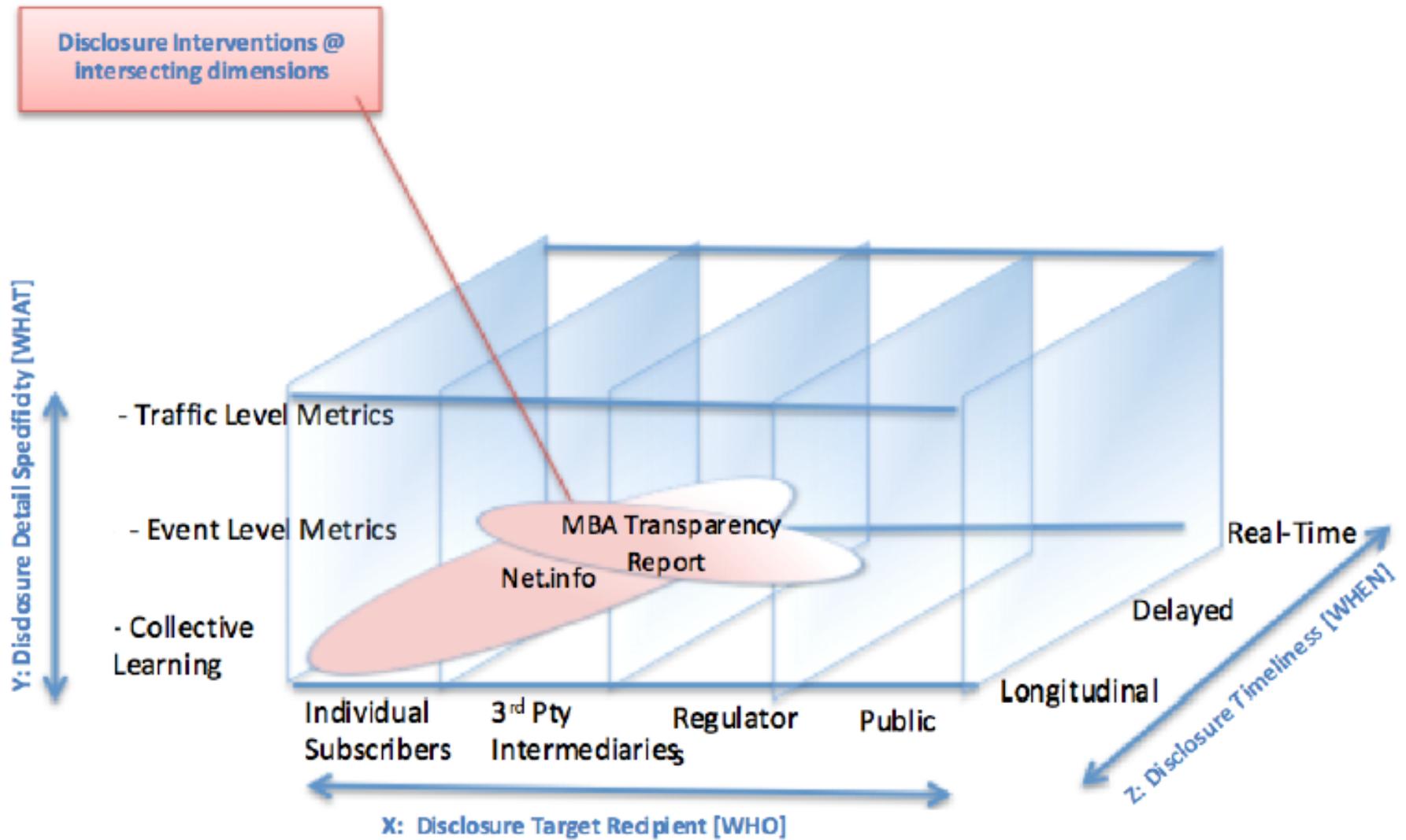
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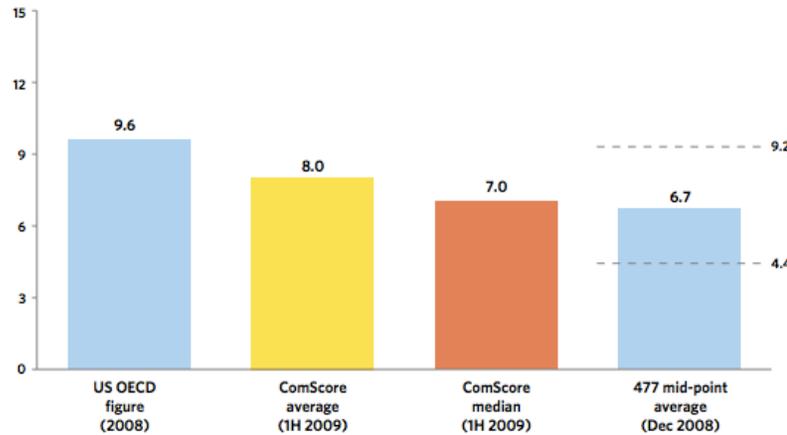
ADDITIONAL SLIDES

Figure 1: Disclosure & Transparency Coordinator

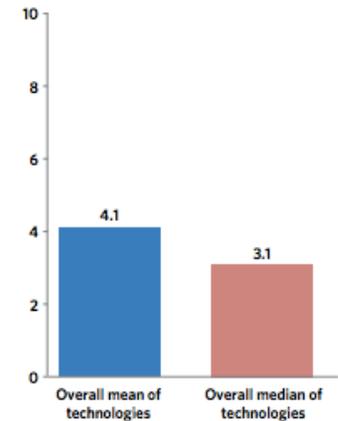


Average advertised download speeds in U.S. in 2009 6.7Mbps, but actual 3.1Mbps

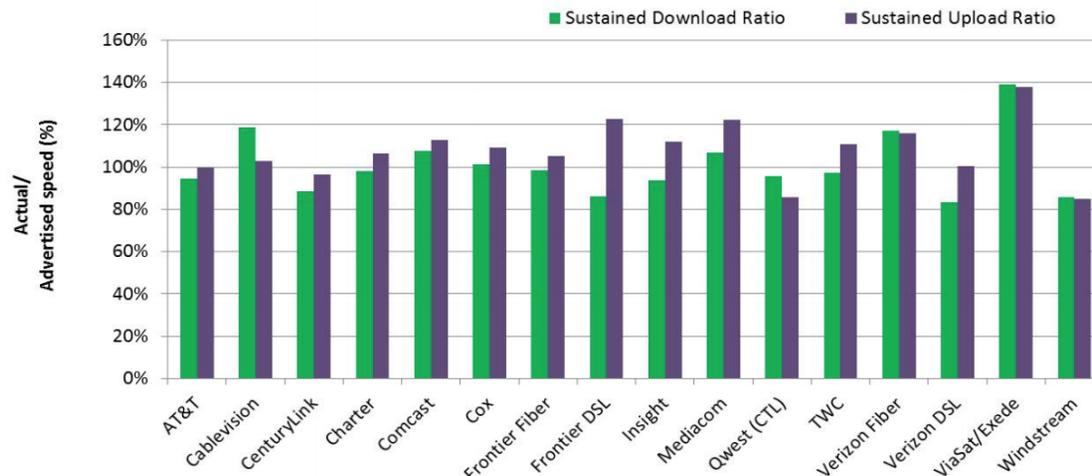
*Exhibit 14:
Advertised Download
Speeds by Various Data
Sources (Mbps)*



*Exhibit 17:
Average (Mean)
and Median Actual
Download Speeds,
Overall and By
Technology (Mbps)*



- Advertised peak ("up to") speeds, not "actual". What *should* expectation have been?
- Measurement problems. FCC launches Measuring BB America (MBA) in 2010.



In 2014, FCC reports
"actual" ~ 100%
"advertised"