Lecture 1 notes (First half)

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Internet Design Challenge

The following requirements make the design of internet challenging:
1. 1 billion to 1 trillion hosts
2. 100 million to 1 billion organizations
3. 100 to 1000 possible different implementations of internet protocols
4. Any type of application to be supported
5. Any networks to be supported

The following are the features that an internet protocol may be expected to support
1. Security, Invulnerability to attack, Privacy
2. Reliability, No single point of failure
3. Performance, speed of delivery
4. Graceful degradation
5. Fault tolerance, availability
6. Evolvability, Upgradability
7. Accountability
8. Scalability
9. Support High or Low bandwidths
10. Manageability
11. Error reporting, Error checking
12. Quality of Service, Support for real-time applications
13. Authentication Service
14. Sensible resource allocation
15. Compatibility, Interoperability
16. Discovery, Naming
17. Scalable searching
18. Responsiveness – if use it, get a response back

Priorities for Internet Design

The following is the list of priorities for the current Internet
1. Interoperability
2. Robustness
3. Heterogeneity, Flexibility, Extensibility
4. Scalability
5. Cost Effectiveness

The following is a list of candidates (in no particular order) for a new intenet design:
1. Robustness
2. Correctness
3. Scalability
4. Extensibility, Flexibility, Heterogeneity
5. Cost Effectiveness
6. Interoperability, Deployability

The following is the order of priorities (by class vote) for a new internet design:
1. Interoperability
2. Robustness
3. Scalability