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LHC high-level network architecture

Erik-Jan Bos
Director of Network Services
SURFnet, The Netherlands

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Contents

- History, mission and the process
- A proposed high-level architecture
- Finalizing the architecture and next steps

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History, mission and the process

- **January 20 & 21, 2005 meeting in Amsterdam chaired by David Foster:**
  - **Presentations by the experiments**
  - **Presentations by some network orgs**
  - **Conclusion: Move from bottom up to top down**
  - **Consensus on small task force for proposing LHC high-level network architecture**
- **April 8, 2005 meeting in Amsterdam chaired by David Foster:**
  - **Presentation of version 1.0 of Architecture Document**
  - **Directions for further evolution of Architecture**

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First steps to the architecture

- **Assumptions:**
  - **High-volume data streams**
  - **Continuous data streams, i.e. 7 x 24**
  - **Keep It Simple**

- **Stay as low in the stack as you can (see January presentations), for as long as you can**

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A proposed high-level architecture (1)

- Optical Private Network (OPN), consisting of dedicated 10G light paths between T0 and each T1
- Special measures for back-ups, both T0-T1 as well as T1-T1
- T0 preferred interface is 10Gbps Ethernet LAN-PHY
- Use eBGP4 in the OPN

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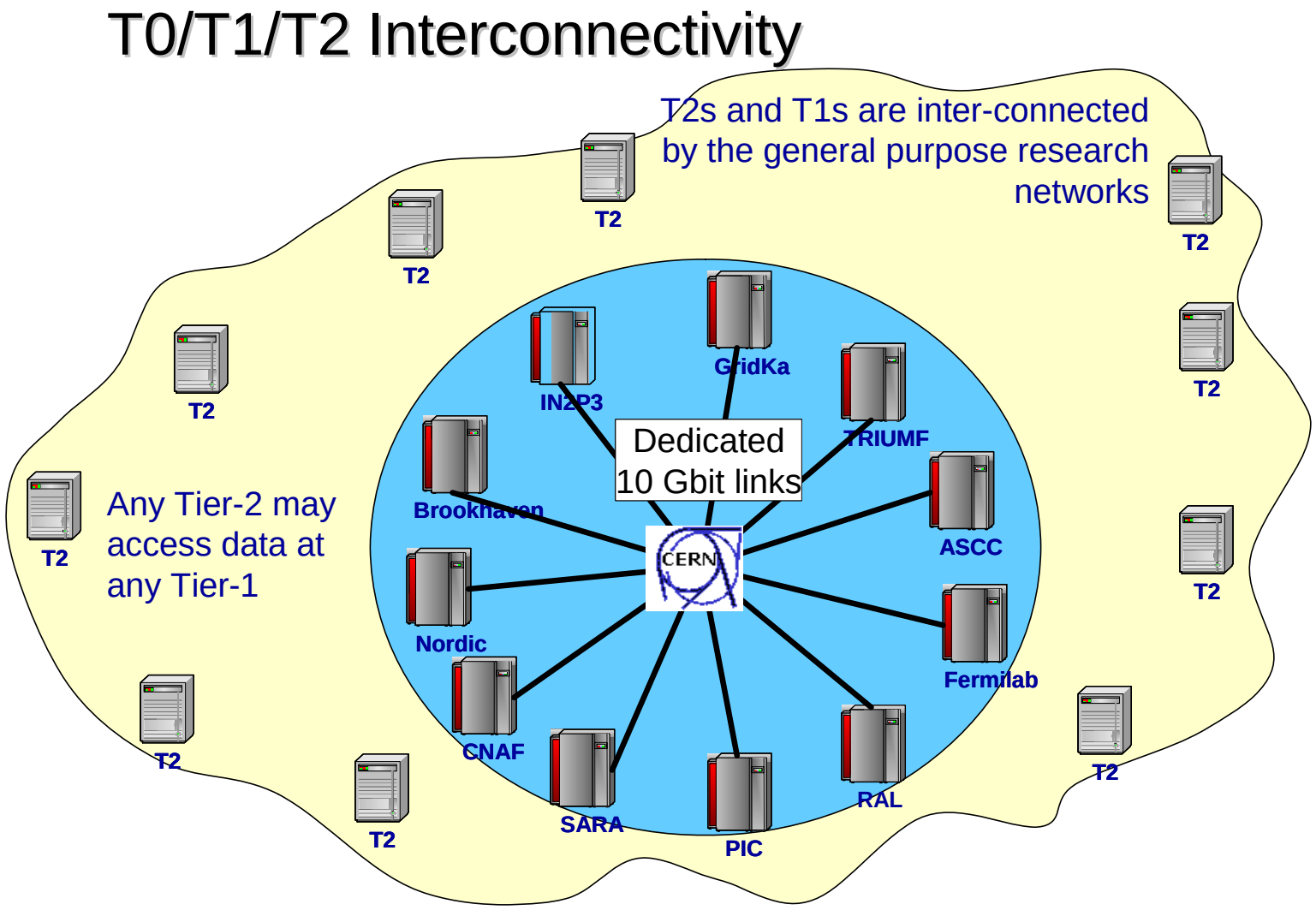
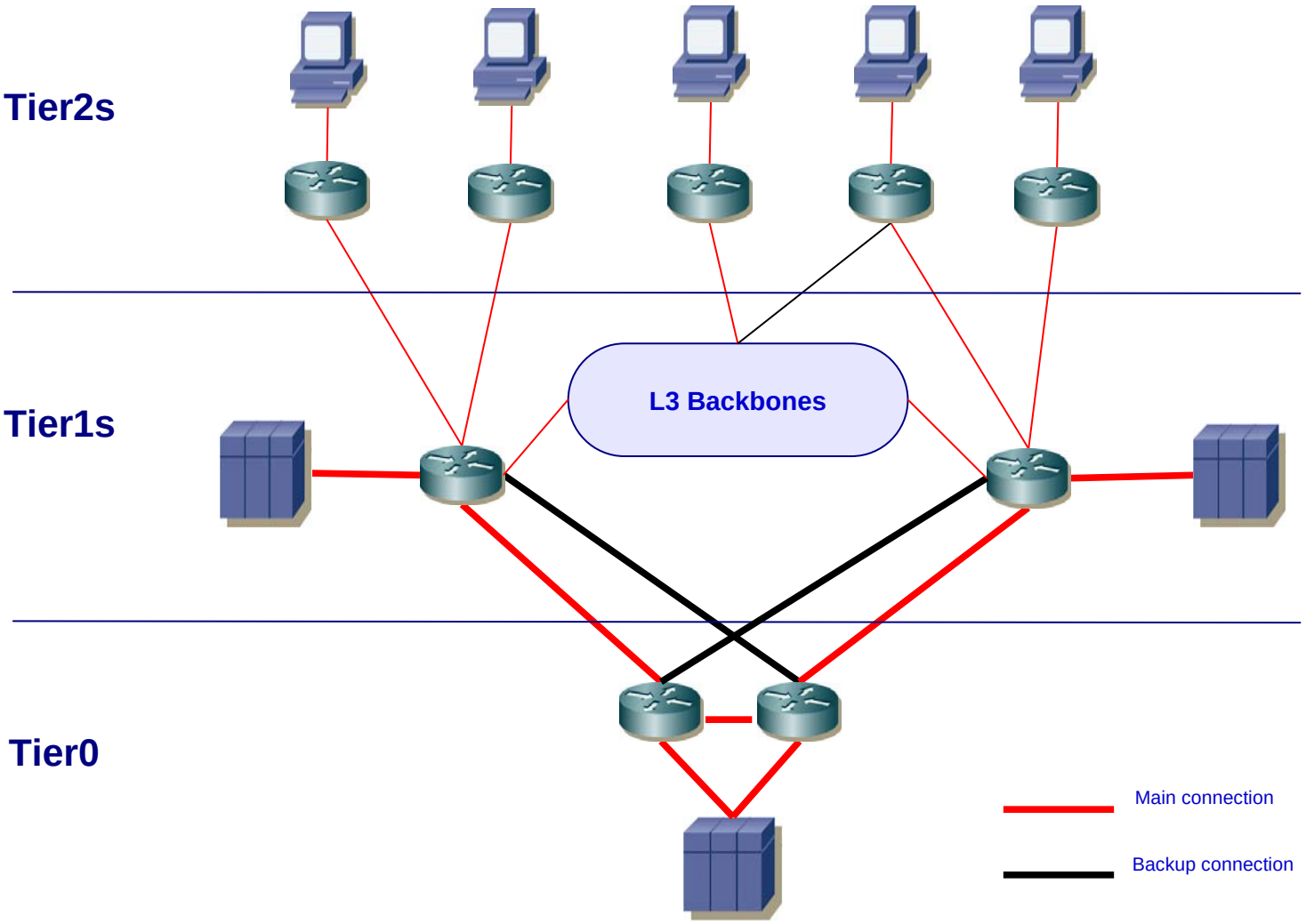
A proposed high-level architecture (2)



A proposed high-level architecture (3)



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Security considerations

- Important to address security concerns already in the design phase
- Architecture will be kept as protected as possible from external access
- At least in the beginning, access from trusted sources (i.e. LHC prefixes) will not be restricted
- Implementation discussion: Firewall vs. ACLs
- Security awareness: Web of trust between T0 and T1s, what do we need to do to satisfy T0 and T1s security officers?

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Suggestions received (1)

- Scott Bradley (BNL): Include possibility that Tier 1 uses firewall in stead of ACLs. Proposal to have both options in the document for a Tier 1; each Tier 1 decides for itself; David Salmon (UKERNA): Discuss. More information needed, e.g. how large flows are handled by multiple 2G blades

- Scott Bradley (BNL): Consider use of Context-based Access Control (CBAC) instead of ACLs

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Suggestions received (2)

- Esther Robles (RedIRIS): Add policy filters when adding T1-T1 BGP sessions

- Ester Robles (RedIRIS): The LHC prefixes used in the LHC OPN should be more specific than the ones announced to other transit networks; if that is not the case, local pref should be used at T1s

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Suggestions received (3)

- David Salmon (UKERNA): AS number for the UK T1 needs to be looked at, as UKERNA's JANET AS number cannot/should not be used

- Steve McDonald (TRIUMF): Consider 10GE WAN PHY at the T1, consequences at the T0

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Planning

- Start date for physics traffic is June 2007
- T1s are encouraged to proceed with provisioning well before that date, ideally already within 2005
- Nevertheless, T1s must be ready at full bandwidth not later than Q1 2006, to be in place for the mid-2006 SC.

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Next Steps

- Get comments in on version 1.9 of the document, some received through e-mail, rest @meeting
- Write the final version 2.0
- T1s must start to work with their NRNs
- European T1s must work on dedicated bandwidth with their NREN who will consult with DANTE for GÉANT2 light paths and/or with commercial carriers and/or with open optical exchange operators; other T1s talk to their NREN (CANARIE, ESnet, ASnet)

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Thank you

Questions?