LHC-T23
A proposed National network to support the needs of the LHC Tier2 & Tier3 Communities
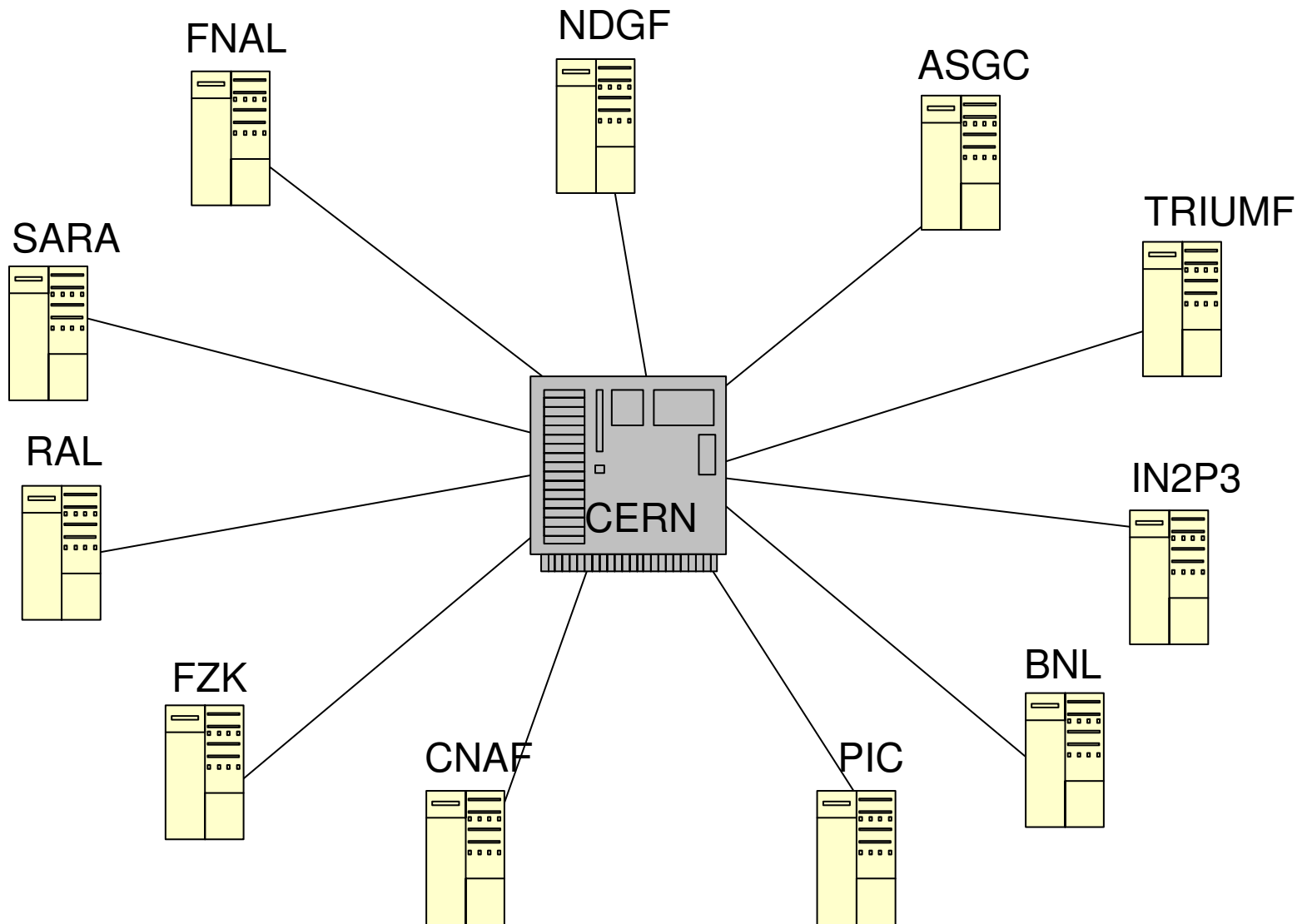
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The US LHC sites

- ATLAS
  - 1 Tier1 site (BNL)
  - 5 Tier2 sites (most multi-institutional)
  - 30 Tier3 sites (2 labs & 28 Universities)
- CMS
  - 1 Tier1 site (FNAL)
  - 7 Tier2 sites
  - 42 Tier3 sites (1 lab & 41 universities)
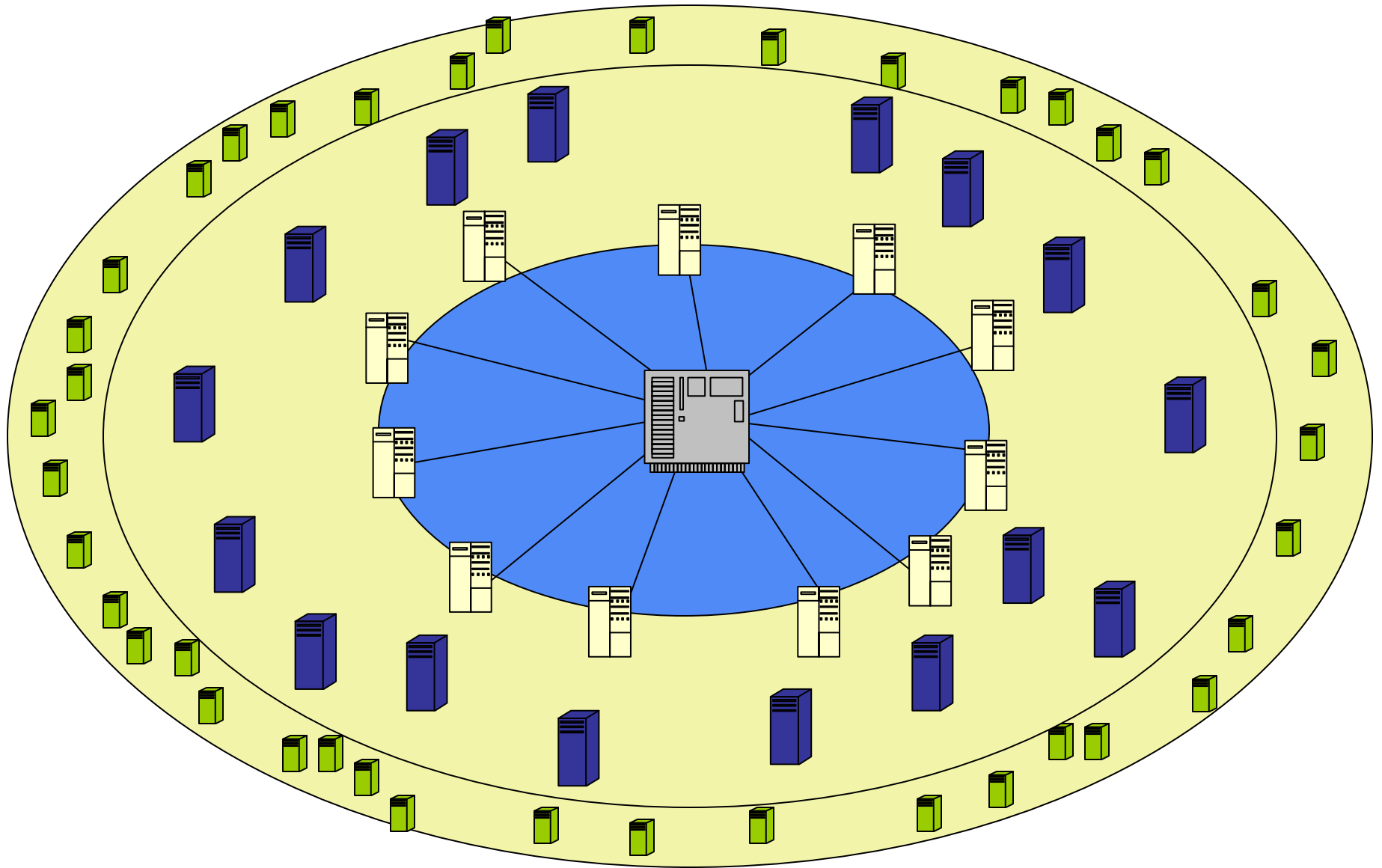- 68 different institutions at the Tier3 level

LHC OPN

LHC OPN

- OPN – Optical private Network
  - Connects Tier0 and Tier1 sites
  - Supports T0 to T1 traffic
  - Supports T1 to T1 traffic
  - Does not provide direct support for T2 or T3 sites
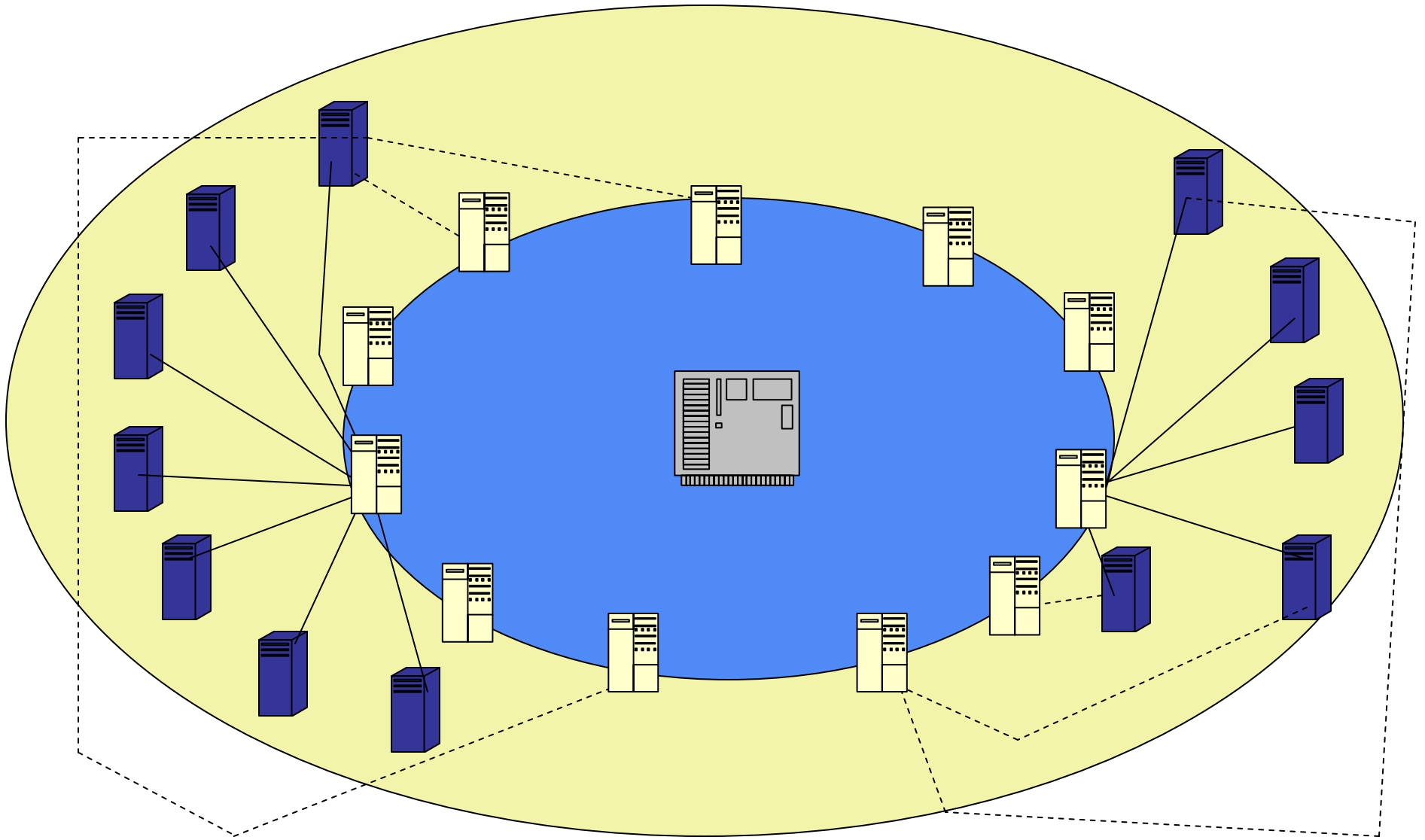   - No peering
    - No transit service

LHC networks

US LHC networks

- US LHC networks include all participating sites
  - Tier 1 sites
  - Tier 2 sites
  - Tier 3 sites
- No LHC specific network designated to support T2 and T3 sites

LHC T23

LHC T23 Provides

- Network Support for all US Tier2 and Tier3 sites
- Partnership between Campus, Regional, National, and International networks
- Single point of contact for network issues
- Allows T2 sites to connect to multiple T1 sites
  - Shared IP service
  - Dynamic circuit based service
- Allows T3 sites to connect to multiple T1 or T2 sites
  - Shared IP / Dynamic Circuit based service

US LHC networks
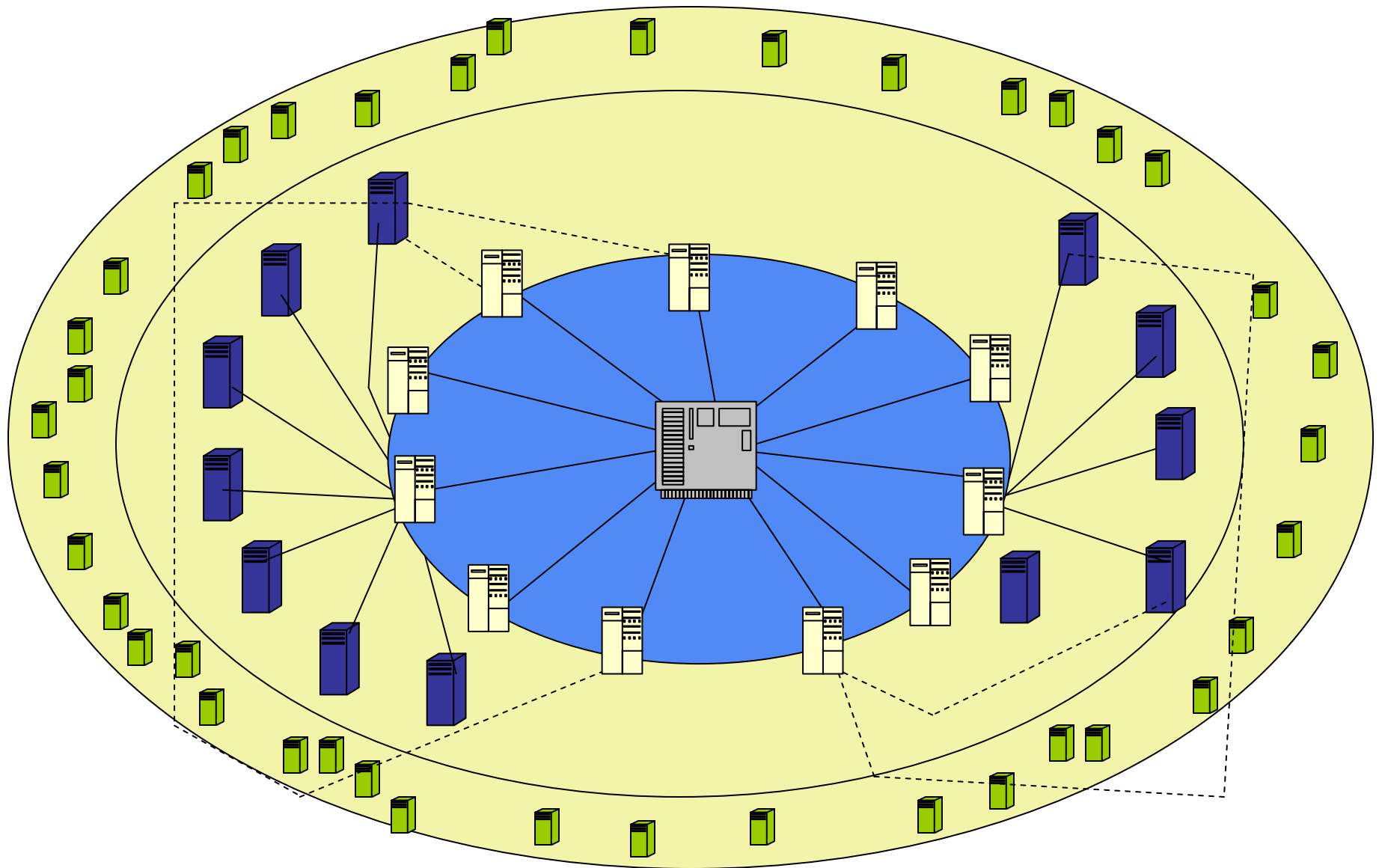
Shared IP services

- Site identifies subnet that should receive LHC-T23 routing

- ISP's establish routes to support this service

- Best Effort service (traditional IP service)

Dynamic Circuit service

- Call setup model
  - Requires telco type metrics
    - How often are connections made
    - How long are connections held
    - What is an acceptable blocking probability
    - Preemption schemes
  - Can convert from usage stats
    - How big is a typical dataset
    - How frequently is the local cache refreshed
    - What is the peak number of requests

Data sets

- Can download & processing co-exist
- What is the probability that the data set will be at the local T1 site
- How geographically disperse are analysis teams
- How much interaction do teams need
- How does simulation data fit into this project

Proposal

- Create a LHC working group to develop a reasonable architecture
  - Defines the data movement needs
  - Defines the how & where connections go
  - Defines who is involved

Architecture details

- Defines the data movement needs
  - Where data is – needs to be
  - How large a chunk of data gets moved
- Defines the how & where connections go
  - Shared IP – peering & bandwidth
  - Dynamic circuits – setup & duration
- Defines who is involved
  - Campus, Regional, National, International
  - Single point of contact or general coordination

- Discussion

- Supplemental Slides follow

Requirements

- Tier2 site defines primary T1 site
  - Specifies link parameters
  - LHC T23 engineered to meet these requirements
- Tier2 site defines alternate T1 site(s)
  - Specifies link parameters
  - Specifies usage time frame
  - LHC T23 engineered to International peering point

Requirements

- Tier3 site defines primary T2 or T1 site
  - Specifies link parameters
  - LHC T23 engineered to meet these requirements
- Tier3 site defines alternate T2 or T1 site(s)
  - Specifies link parameters
  - Specifies usage time frame
  - LHC T23 engineered to International peering point