



ESnet Program

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(www.es.net)



Computational & Networking Needs - Biology & Bioinformatics -

Problem Component	Computing Speed	Network	Storage
Genome Assembly	>10 TeraFlops sustained to keep up with expected sequencing rates	OC3 to OC12 (155Mbs to 622Mbs)	300 TB per genome
Protein Structure Prediction	>100 TeraFlops per protein set in one microbial genome	OC12 (622Mbs)	Petabytes
Classical Molecular Dynamics	100 TeraFlops per DNA-protein interaction	OC48 (2.4Gbs)	10s of Petabytes
First Principles Molecular Dynamics	1 PetaFlops per reaction in enzyme active site	OC192 (10Gbs)	100s of Petabytes
Simulations of Biological Networks	>1 TeraFlops for simple correlation analyses of small biological networks	??? (100Gbs)	1000s of Petabytes

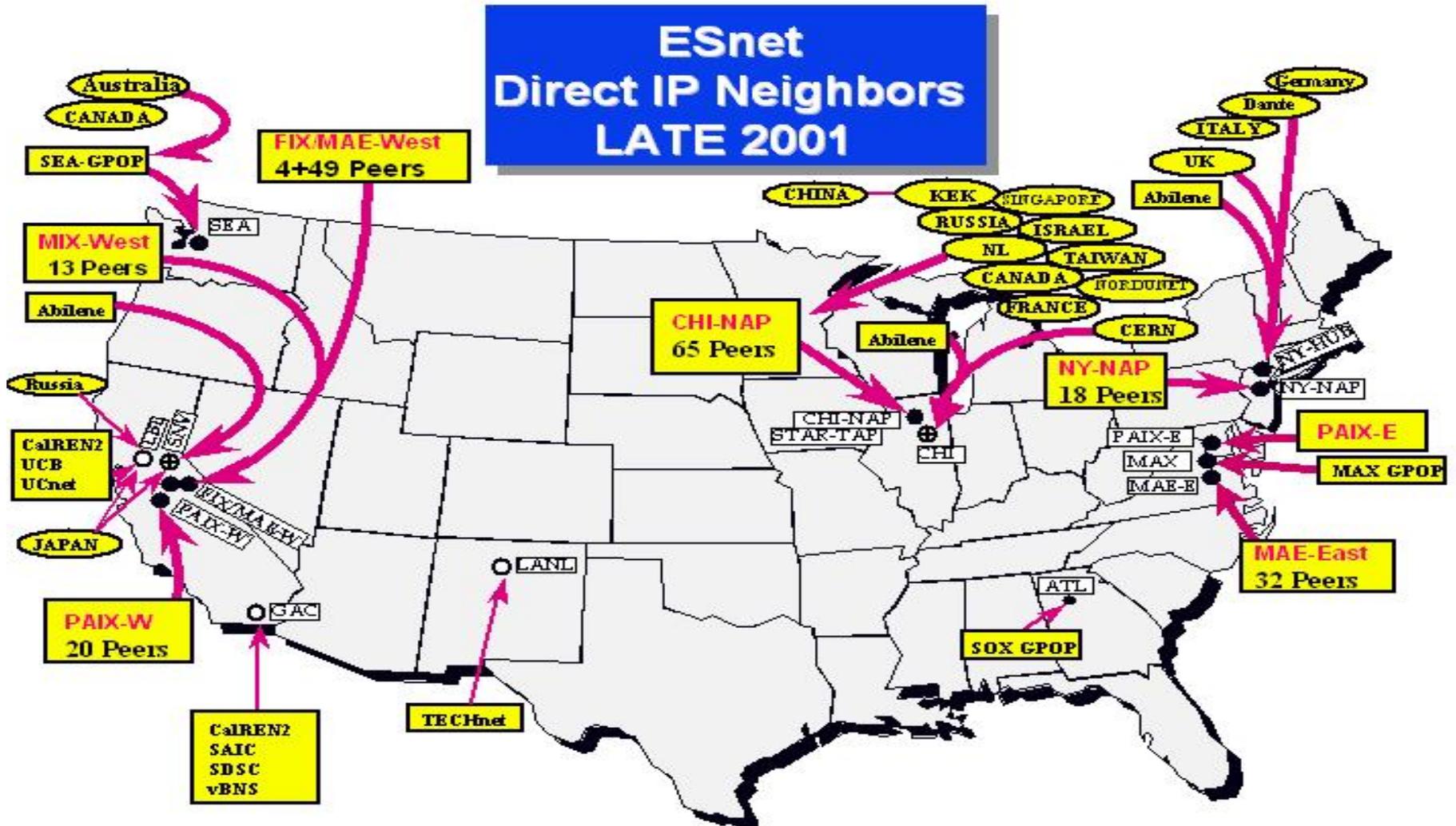


ESnet – A DOE Resource

- **Mission:**
 - Provide, interoperable, highly capable and reliable communications infrastructure and leading-edge network services that support DOE's missions
- **Vision:**
 - Provide advanced network capabilities to enable seamless collaborations for DOE and its researchers
- **Role:**
 - Underpin Office of Science investments in high-performance computing hardware critical to the success of research programs.



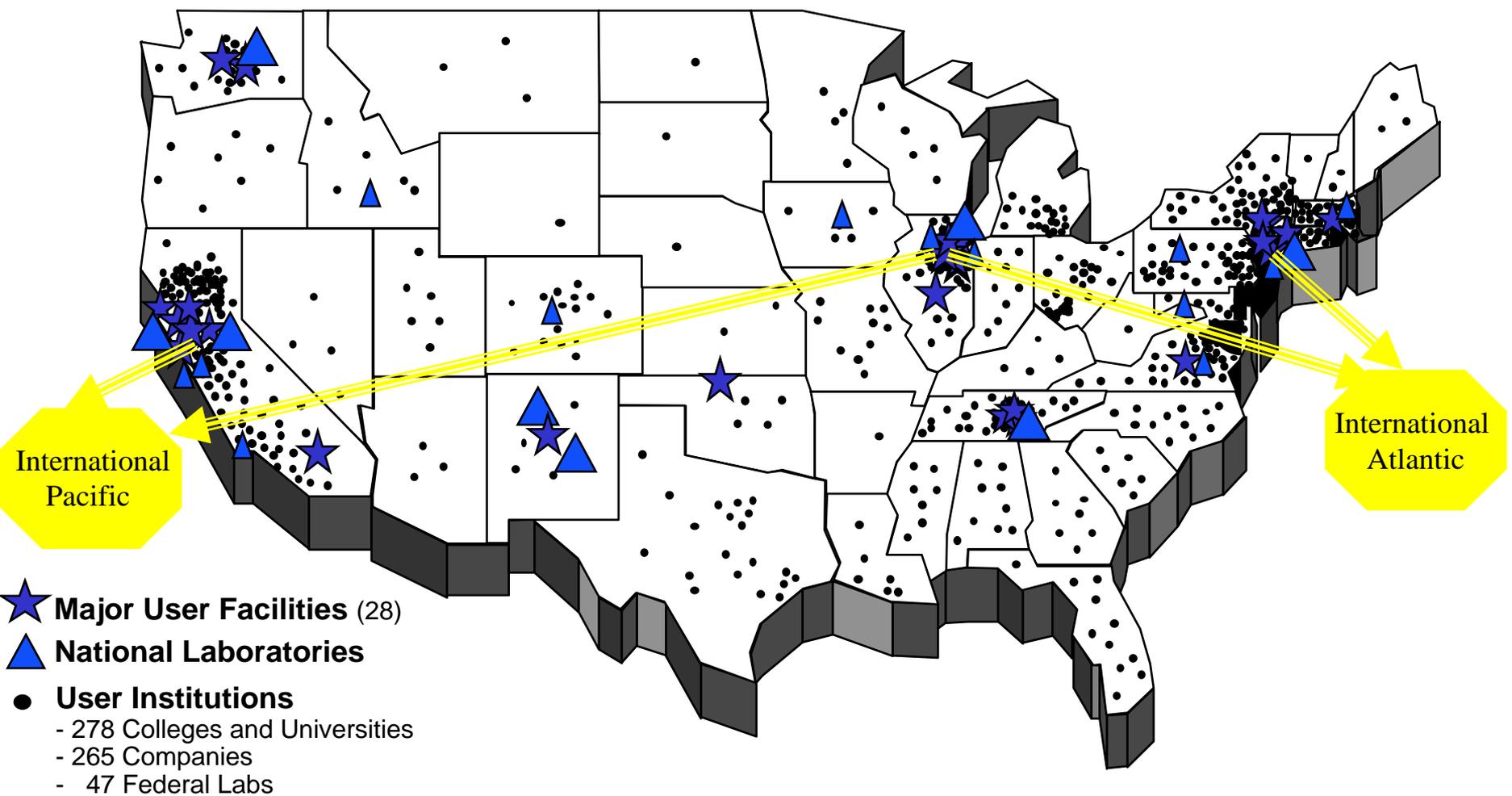
ESnet Connectivity





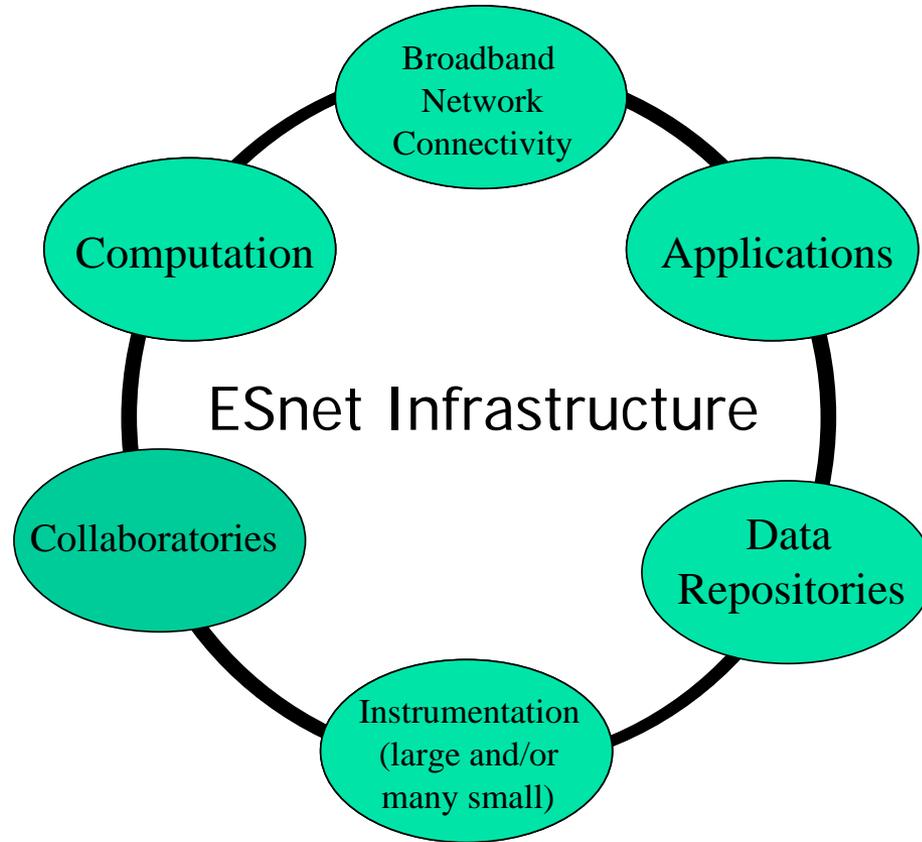
ESnet Community

ER User Facilities and the Institutions Who Use Them





What is ESnet used for



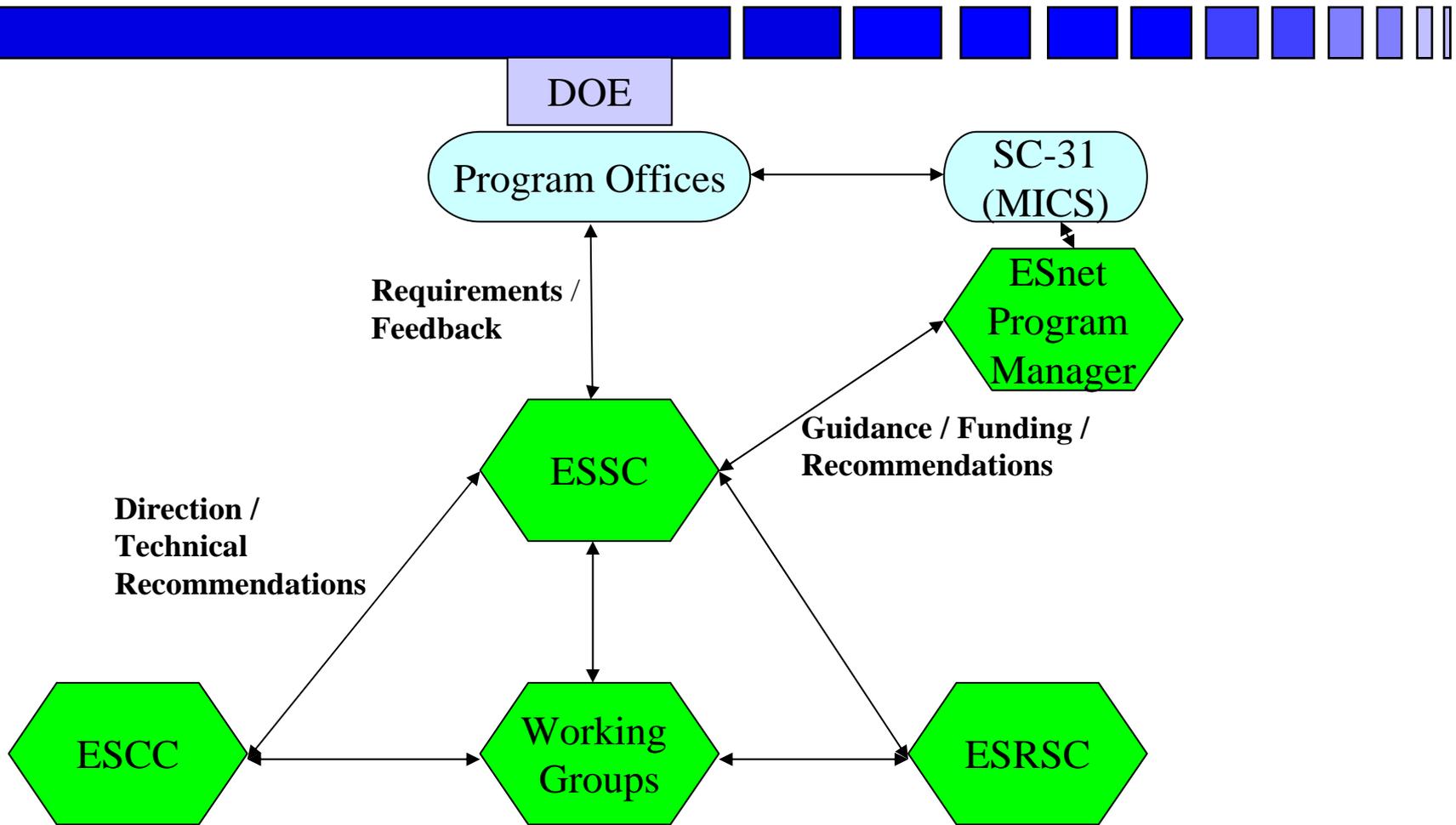


ESnet Network

- ESnet Supports
 - Operational High Performance Net
 - Experimental Infrastructure Net
 - Experimental Research Net



ESnet Program - Committees





ESnet Major Benefits

- Provides leading edge network capabilities
 - email, WWW, data files, administrative functions
- Establishes a stable platform for DOE research
 - Parallel Computations, Instrument Control, Remote Conferencing, Remote Collaboration, Code Development, Access to DOE facilities, Effective Interagency and International Cooperation and Coordination, Effective use of DOE resources
- Promotes Technology Integration
 - leading edge implementation of technology
 - technology partnerships



ESnet Program - Impact

- ESnet provides a spectrum of “core” services that are essential components of an advanced scientific research collaborative environment for DOE
- ESnet provides a testbed for new technology research and implementation

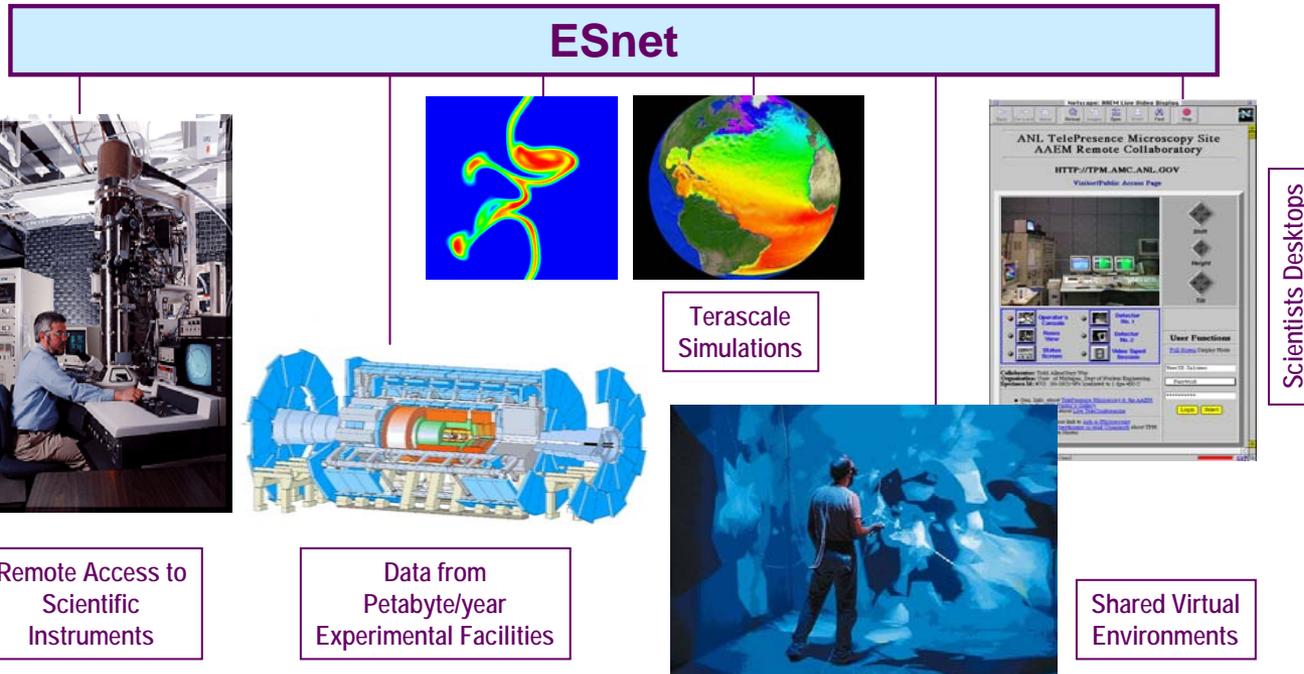


ESnet Success Stories



National Collaboratories *What and Why?*

Collaboratories link geographically distributed researchers, data, and tools via networks to enable remote access to facilities, access to large datasets, shared environments, and ease of collaboration





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The End

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