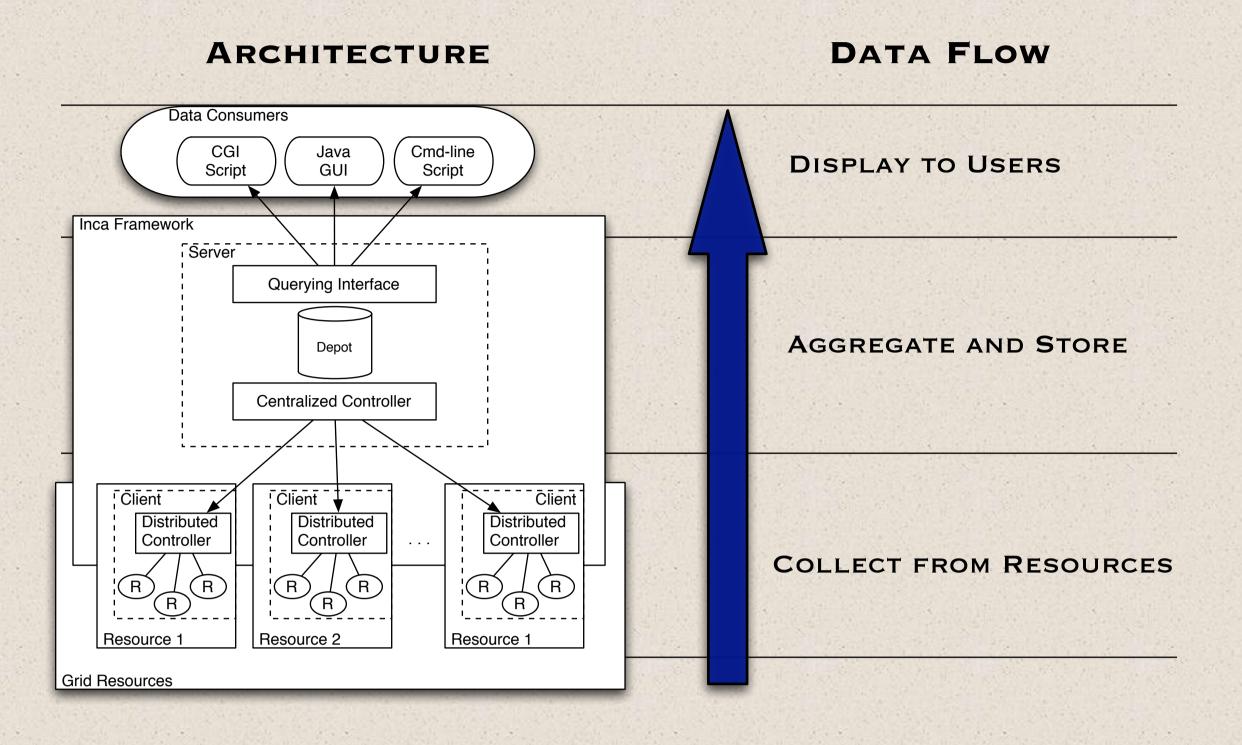
BENCHMARKING AND MEASURING GRID PLATFORMS: SOFTWARE TOOLS AND RESULTS ON THE TERAGRID

INCA

FRAMEWORK FOR AUTOMATED MONITORING OF GRID SYSTEMS

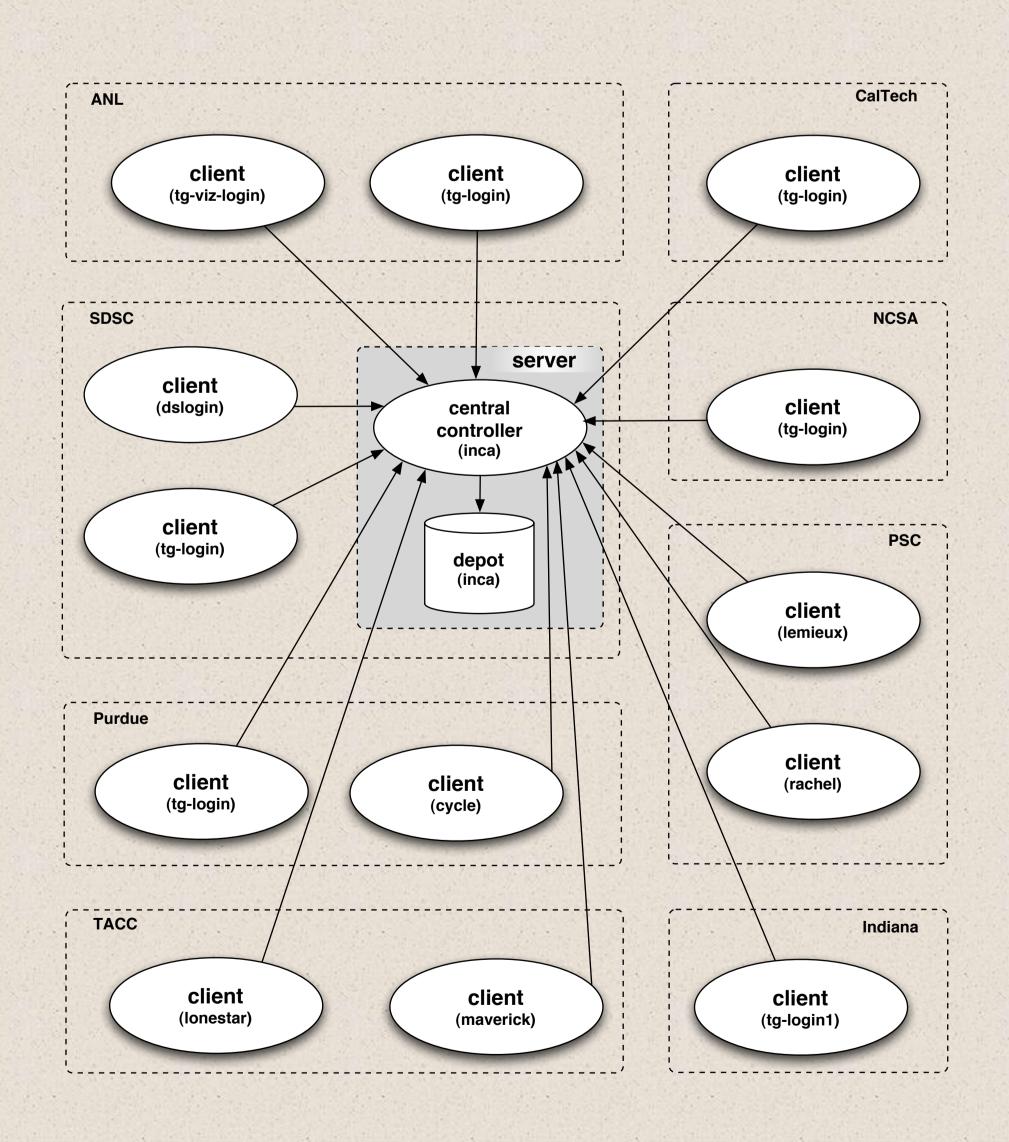


USE CASES:

THE BASIC DATA COLLECTION AND ANALYSIS FRAMEWORK PROVIDED BY INCA SUPPORTS A DIVERSE SET OF USE CASES.

- SERVICE RELIABILITY
- MONITORING
- BENCHMARKING
- SITE INTEROPERABILITY CERTIFICATION
- SOFTWARE STACK VALIDATION

TERAGRID DEPLOYMENT:



GRASP

GRID ASSESSMENT PROBES

LIKE ALL COMPUTING PLATFORMS, GRIDS ARE IN NEED OF A SUITE OF BENCHMARKS BY WHICH THEY CAN BE EVALUATED AND CHARACTERIZED. DUE TO THE DYNAMIC NATURE OF GRIDS, A ONE TIME EVALUATION IS NOTSUFFICIENT; EFFECTIVE MEASUREMENTS MUST BE COLLECTED PERIODICALLY AND VIEWED AS A TIME SERIES.

	3 NODE	GATHER	CIRCLE
BASIC TOPOLOGIES	Data	Data Compute Results Data	Data Data
TERAGRID DEPLOYMENT	AAN PURINT PSC SOSC TACC	TACS	Calledon Costs
TERAGRID DATA 1 DAY	GRASP - 3 node probe 400 400 200 00:00 06:00 12:00 18:00 Authorizing3Hosts VerifyParams QueryingMDS DBTransferTime ActualComputeTime ResultsTransferTime ActualQueueTime	GRASP - gather probe 200 100 00:00 06:00 Authorizing SHosts Datafile Transfer Time Querying MDS Total Compute Time Results Transfer Time	GRASP - circle probe 400 200 00:00 06:00 12:00 TransferFromNode1 TransferFromNode2 TransferFromNode3 FinalCheckAndCleanup
1 WEEK	GRASP - 3 node probe 1500	GRASP - gather probe 2000 1000 Thu Fri Sat Sun Mon Tue Wed AuthorizingSHosts DatafileTransferTime QueryingMDS GRASP - gather probe	GRASP - circle probe Spund of the probe of
1 MONTH	1500 1500 Week 41 Week 42 Week 43 Authorizing3Hosts VerifyParams QueryingMDS DBTransferTime ActualComputeTime ResultsTransferTime ActualQueueTime	1500 Week 41 Week 42 Week 43 Week 44 AuthorizingSHosts DatafileTransferTime QueryingMDS TotalComputeTime ResultsTransferTime	Week 41 Week 42 Week 43 Week 44 Authorizing4Hosts TransferFromNode0 TransferFromNode1 TransferFromNode2 TransferFromNode3 FinalCheckAndCleanup

TERAGRID

DISTRIBUTED INFRASTRUCTURE FOR OPEN SCIENTIFIC RESEARCH

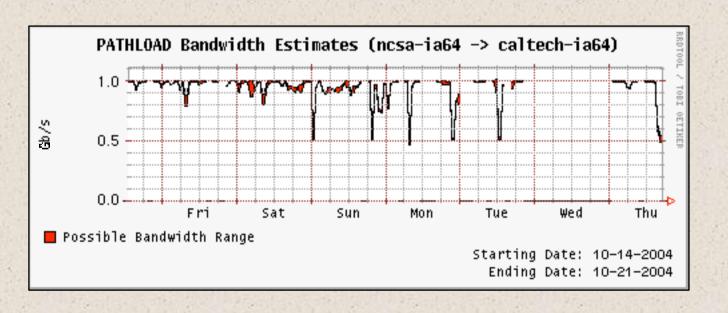


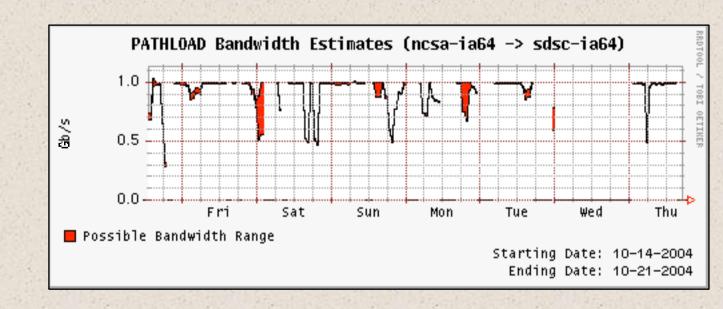
RESOURCE SUMMARY:

THE TERAGRID OFFERS 40 TERAFLOPS OF COMPUTING POWER DISTRIBUTED AT NINE SITES, FACILITIES CAPABLE OF MANAGING AND STORING NEARLY ONE PETABYTE OF DATA, HIGH-RESOLUTION VISUALIZATION ENVIRONMENTS, AND TOOLKITS FOR GRID COMPUTING. TERAGRID'S TIGHTLY INTEGRATED COMPONENTS ARE CONNECTED THROUGH A 40 GIGABITS PER SECOND NETWORK

INCA NETWORK MEASUREMENTS: (E2E REPORTER)

- PROVIDES TERAGRID USERS WITH SITE-TO-SITE PERFORMANCE BASELINES
- WRAPS NETWORK MEASUREMENT TOOLS
- COLLECTS MEASUREMENTS
- ARCHIVES RESULTS IN RRDTOOL
- DISPLAYS RESULTS IN TIME-SERIES GRAPHS





IN THE TWO GRAPHS ABOVE, PATHLOAD MEASURES DYNAMIC AVAILABLE BANDWIDTH OVER TIME ON TWO DIFFERENT E2E PATHS (NCSA->CALTECH AND NCSA->SDSC.) PATHLOAD [DOVROLIS ET AL] USES EFFICIENT AND LIGHTWEIGHT PROBES AS PART OF A METHODOLOGY CALLED SLOPS (SELF-LOADING PERIODIC STREAMS) TO ACCURATELY MEASURE E2E AVAILABLE BANDWIDTH FROM A USER'S PERSPECTIVE.

PARTICIPANTS

ORGANIZATIONS