



TM and © Laurent de Brunhoff

Data Distribution

Tim Adye

Rutherford Appleton Laboratory

BaBar Collaboration Meeting

27th June 2001

- **Kanga Exports**
 - Export tools
 - Kanga data at SLAC
 - Skims and Streams

- **Objectivity Distribution**
 - SP Transfers
 - Exports to IN2P3
 - Multiple federations
 - Future of BdbDistTools
 - SRB

Kanga Exports

Kanga Status

- New Kanga distribution system **complete** and **in use** at many sites [A.Forti, T.Adye]
 - Uses local copy of skimData database and **fast transfer tools**
 - **Automatic** operation
 - **Documentation** (BaBar -> Computing -> Data Dist -> Kanga Remote)
- Kanga **backup/archive** procedure complete [A.Dorigo]
 - In use at Rome, under test elsewhere
 - Requires **local customisation** for different tape systems
 - eg. HPSS at SLAC
 - No automatic **staging** system yet

As of 25 June. Some similar skim releases combined.

Kanga Data at SLAC

Skim Release	Stream	Files	Events	GBytes	Skim Release	Stream	Files	Events	GBytes
Skim880g	AllEventsKanga	3671	301768409	940.4	K865aP1	SPKanga	59277	110804500	673.7
Skim880g	Stream1Kanga	3671	25728952	75.9	Skim880gMC	Stream1Kanga	1340	3024185	17.7
Skim880g	Stream2Kanga	3671	15684636	30.4	Skim880gMC	Stream2Kanga	1340	0	0.0
Skim880g	Stream3Kanga	3671	8405724	46.9	Skim880gMC	Stream3Kanga	1340	3062910	25.0
Skim880g	Stream4Kanga	3671	8800351	48.1	Skim880gMC	Stream4Kanga	1340	3707631	29.7
Skim880g	Stream5Kanga	3671	17846310	102.5	Skim880gMC	Stream5Kanga	1340	6407115	55.0
Skim880g	Stream6Kanga	3671	55896432	304.0	Skim880gMC	Stream6Kanga	1340	23238484	186.2
Skim880g	Stream7Kanga	3671	20785574	93.2	Skim880gMC	Stream7Kanga	1340	6534561	46.3
Skim880g	Stream8Kanga	3671	9897767	47.3	Skim880gMC	Stream8Kanga	1340	3323418	24.7
Skim880g	Stream9Kanga	3671	12906058	69.2	Skim880gMC	Stream9Kanga	1340	5504771	43.6
Skim880g	Stream10Kanga	3671	8715625	36.9	Skim880gMC	Stream10Kanga	1340	2248636	16.9
Skim880g	Stream11Kanga	3671	32106681	163.6	Skim880gMC	Stream11Kanga	1340	12649879	96.0
Skim880g	Stream12Kanga	3671	32231108	160.7	Skim880gMC	Stream12Kanga	1340	12643846	93.9
Skim880g	Stream13Kanga	3671	10869249	42.3	Skim880gMC	Stream13Kanga	1340	3851969	23.8
Skim880g	Stream14Kanga	3671	9917657	46.8	Skim880gMC	Stream14Kanga	1340	4384164	29.5
Skim880g	Stream15Kanga	3671	25966605	52.2	Skim880gMC	Stream15Kanga	1340	332177	2.3
Skim880g	Stream16Kanga	3671	5359779	23.2	Skim880gMC	Stream16Kanga	1340	1569058	12.1
Skim880g	Stream17Kanga	3671	23833525	121.8	Skim880gMC	Stream17Kanga	1340	6639032	50.5
Skim880g	Stream18Kanga	3671	8209941	37.5	Skim880gMC	Stream18Kanga	1340	0	0.0
Skim880g	TauQEDalleventsKanga	3671	36969680	109.7	Skim880gMC	TauQEDalleventsKanga	1340	8649903	42.8
Skim880g	JpsitollKanga	341	523704	2.5	Skim880gMC	JpsitollKanga	1340	1826425	13.2
Skim880g	DiLeptonKanga	341	452300	2.2	Skim880gMC	DiLeptonKanga	1340	1661210	12.0
Skim880g	BPCBhabhaKanga	1784	4574388	7.0	Skim880c	BrecoBTagKanga	3055	26609706	120.6
Skim880g	BPCElectronKanga	2305	870130	1.3	Skim880c	DiLeptonKanga	3348	4181018	17.2
Skim880g	BPCKLongKanga	3270	9449	0.1	Skim880c	DstarlnuKanga	3055	15430377	76.7
Skim880g	BPCKaonKanga	1469	1305421	5.3	Skim880c	JpsitollKanga	3348	4867950	19.7
Skim880g	BPCMunKanga	1469	5346344	6.9	K8.6.2d	SPKanga	24478	34505500	192.5
Skim880g	BPCPionKanga	1469	3053648	11.8	K863cP1	SPKanga	1945	3458000	17.6
Skim880g	BPCProtonKanga	1469	466018	1.5					
Totals					213983 999617890 4530.3 GB				

MC

Old data

Skim & Stream usage

- **Survey** of skim requirements outside SLAC [R.Jacobsen]
 - **8** streams not imported by anybody
 - A few streams' skim content could be **optimised**
 - Total Kanga dataset is **3 × AllEvents** to allow for all **Streams**
 - Same for Objy if we duplicate events in each stream
- **SLAC** (and probably other Tier A/B sites) needs the **space** to store 2001 data.

Following plans are still under discussion...

Proposals for skims / streams

- The proposal is to replace some or all of the streams on disk **at SLAC** by Kanga “index collections”
 - Index collections contain **pointers** to event data in **AllEventsKanga ROOT** files
 - Can have index collections for each **skim**
- What to do for exports to **smaller sites** (Tier C)?
 - Index collections require full AllEventsKanga event data
- Possible **solutions**: some combination of
 - Only delete streams not used outside SLAC
 - For **new data**, keep stream files on disk until exported
 - Keep stream files in **HPSS**; use that for export
 - Generate skim event files as part of export procedure (**on-the-fly**)

Objectivity Distribution

SP Transfers

- Lots of work on transferring SP data from remote production centres
 - MocaEspresso – exports databases in parallel with production [D.Andreotti, E.Leonardi]
 - Automatic import and bookkeeping procedures at SLAC [C.Bulfon, L.Mount, A.Hasan, A.Trunov]

⇒ See Fergus' talk

Exports to IN2P3

- BdbServer and BulkServer export **micro** and a subset of **RAW+REC** respectively [D.Boutigny, A.Zghiche]
 - Both fully **automatic**
 - Coordinated with **sweep** into physboot et al
 - BdbServer can also be used for smaller-scale **user exports**
 - Run as servers at SLAC; now in CVS (BdbDistUtil)
- Still some **worries**
 - exports > 1TB file system **limit** (last was 910GB)
 - How to handle multi-federation “**bridge collections**”
- Imports at IN2P3 also automated
 - **Jimport** now in CVS [J-N.Albert, A-M.Lutz]
 - Need **guinea pigs** to try export/import at another site
 - **Bulk** (Tier A/B) and **specific** (Tier C)

Multiple Federations

- Multiple federations should eventually greatly **simplify** data distribution
 - Removes limit on total number of DB files
 - ⇒ Can write **smaller** DB files
 - ⇒ Can add more **streams**?
 - ⇒ Reduce unwanted data in export
 - Improves **modularity** of import and export
- ... later. **Right now** we need to
 - add support to data distribution tools
 - Handle master federation and bridge collections
 - treat each federation separately for the moment

Future of BdbDistTools

- BdbDistTools provide **low-level** import and export functionality
 - Mostly used by other applications: BdbServer, MocaEspresso, ...
 - Some **direct use**
 - Eg. Loading conditions into a new federation
- Due to continual development, and change in emphasis, BdbDistTools has become **unmaintainable**
 - Embarking on complete **redesign**
 - First step is to determine **requirements**
- Users of the existing BdbDistTools please check survey in **DataDist HN (#175)**

The future

- Storage Resource Broker (SRB) [SDSC]
 - Being adapted for Objy/BaBar use [R.Schmitz, A.Hanushevsky, A.Hasan]
 - Keeps track of data locations
 - Manages replication between different sites
- Other GRID tools?
 - GLOBUS, GDMP,...

Summary

- **Kanga** distribution tools up and **running**
 - May need to **modify** procedures, depending on plans for **skim & stream** production and storage
- **Objectivity** exports to IN2P3 **running** smoothly
 - Need to think about very large exports and multiple federation support
- Looking at **SRB** to manage future data replication