



# Briefing on eNaTIS

Presented by:

Department of Transport

23 May 2007

Portfolio Committee on Transport

National Assembly



# Award of contract RT1194KA

- Tender issued Nov 2000, closed Feb 2001
- Awarded to Masiye Phambili (Tasima) in Jul 2001
- Contract RT1194KA signed on 3 December 2001 with Tasima (Pty) Ltd
- Decision to award to Tasima was challenged in High Court in Feb 2002 after temporary interdict was given in Dec 2001
- High court dismissed application with costs
- Effective date re-scheduled to 1 June 2002 after interdict application



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# Risks remaining on NaTIS

- Source code compromised
- Ageing technology cannot be maintained
- Decline in specialised resources
- Non-industry standard configuration
- NaTIS contract open ended with no expiry date, Treasury requested new tender be issued
- Continuing with the eNaTIS would have been against direct instructions from treasury



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# Reasons for eNaTIS

- The old NaTIS was 14 years old
- Based on distributed network of servers
- Old technology mostly end-of-life already
- High cost of maintenance and development of new features
- Due to technical limitations the Department of Transport embarked on a technology upgrade project to allow for integrated systems approach
- On insistence of Treasury/State Tender Board the Department of Transport had to issue new tender



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# Reasons for eNaTIS

## Advantages of Centralised Database

- Improved data integrity
- No synchronisation problems between distributed databases
- Easy data extraction
- Better security on centralised configuration
- Lower cost of maintenance and new features
- Easier to interface with other systems
- Rapid deployment of new software



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# Reasons for eNaTIS

## Advantages of new software

- Lower cost of ownership (technical skills more available due to open standards)
- Easy to update introduce new software
- Modern Windows-based front-end
- Standard technology, no proprietary lock-in (Source code protected by independent third party, DoT can rebuild system with source code and documentations placed in safe keeping at third party)
- Platform independent system can be migrated between various platforms (i.e. Windows, Unix, Linux,)
- Wide use of open source



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# Reasons for eNaTIS

## Enhancements included

- Central driving and learner licence booking system
- User friendly user interface
- Multiple method of payments
- Improved auditing and control
- Blank certificate control (face value forms)



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# Reasons for eNaTIS

## Future enhancements

- Internet/ATM service delivery
- Administrative Adjudication of Road Traffic Offences (AARTO)
- Biometrics, smart card technology and radio frequency tags
- Business process management with workflow
- New interfaces with financial institutions
- Handheld devices for law enforcement



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# Contract deliverables

- Custom developed application based on NaTIS release 76
- 2000 work stations at 684 sites (incl one year on-site support)
- Data centre and Disaster recovery centre for 2001 specifications and expected growth
- Data migration from old NaTIS
- National Call Desk
- 9 Provincial help desks
- Project Office, Business Office



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# Scope expansion

- The custom developed application required 9 additional releases of old NaTIS
- New functionalities required for eDate was identified
- 50% more user stations (from 2000 to 3000)
- Almost 90% growth in sites (from 684 to 1270)
- Vehicle population grew by 53%
- Database storage requirements more than doubled



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# Contract governance

- National Steering Committee governs project:
  - Department of Transport
  - 9 Provinces
  - RTMC
- Formal change control mechanism
- Formal project management in terms of international best practice



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# Contract period & Value

- Contract period: 5 years
- Effective Date: 1 June 2002
- Contract Value: R354 million including VAT plus:
  - Imported items linked to foreign exchange fluctuations
  - Resources linked to CPI
- Current adjusted contract value is R408 million



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# Technical complexity

- 4.6 billion data records
- 1270 sites
- 3000 PC workstations
- Total rewrite of 303 transactions
- Re-alignment of specifications and old NaTIS source code
- Confirmation of business processes



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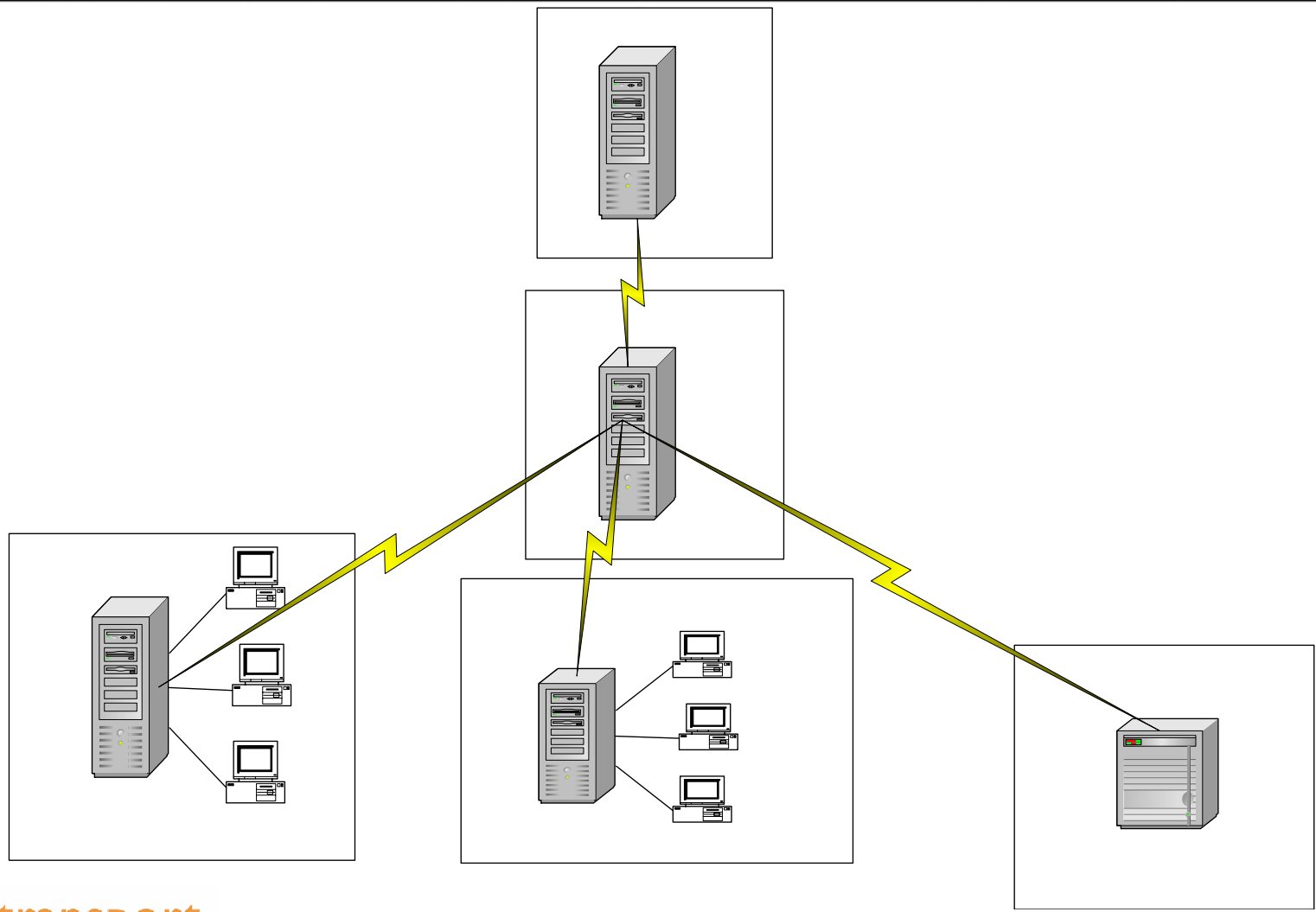
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# NaTIS Network Architecture



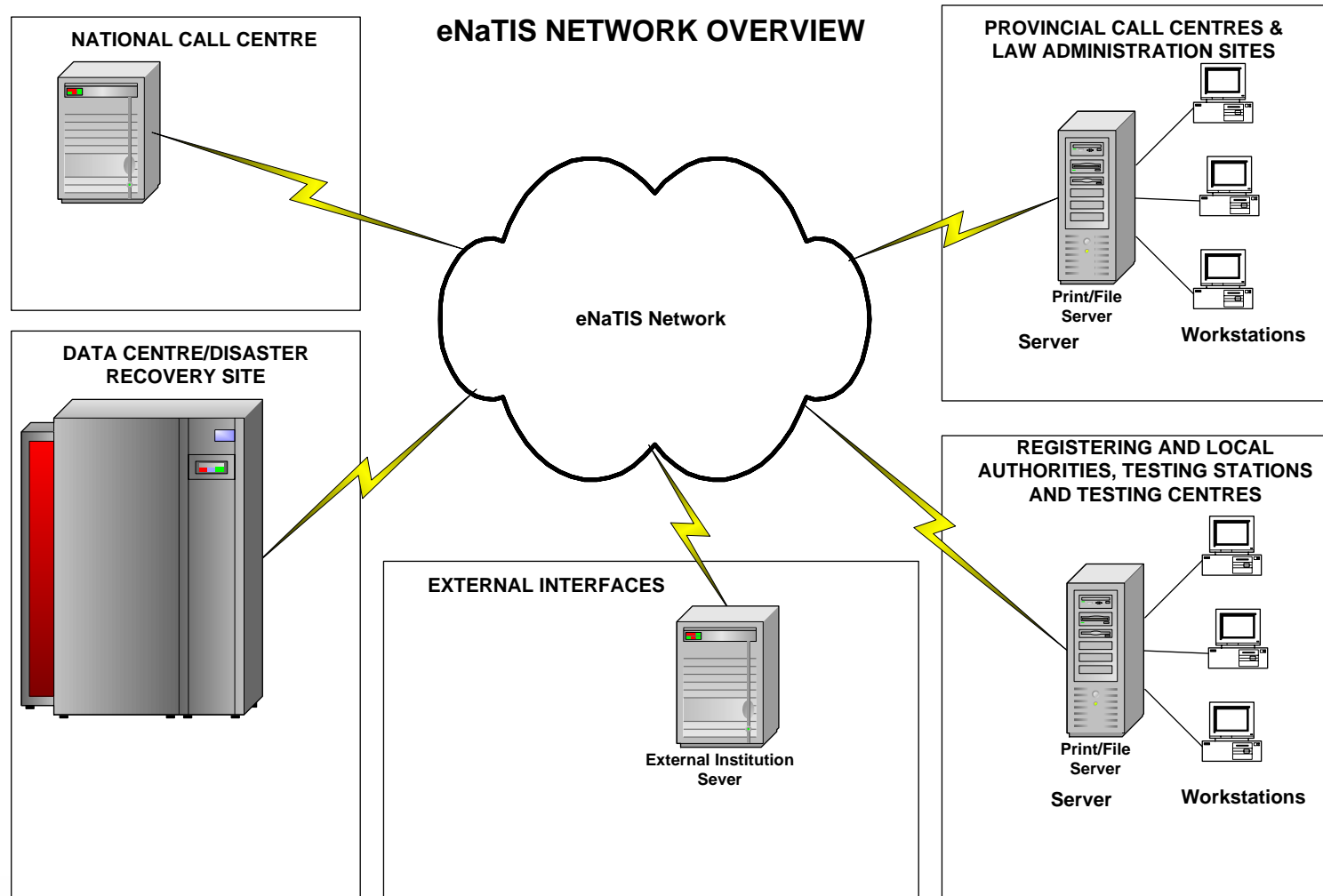
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**eNaTIS**

# eNaTIS Architecture



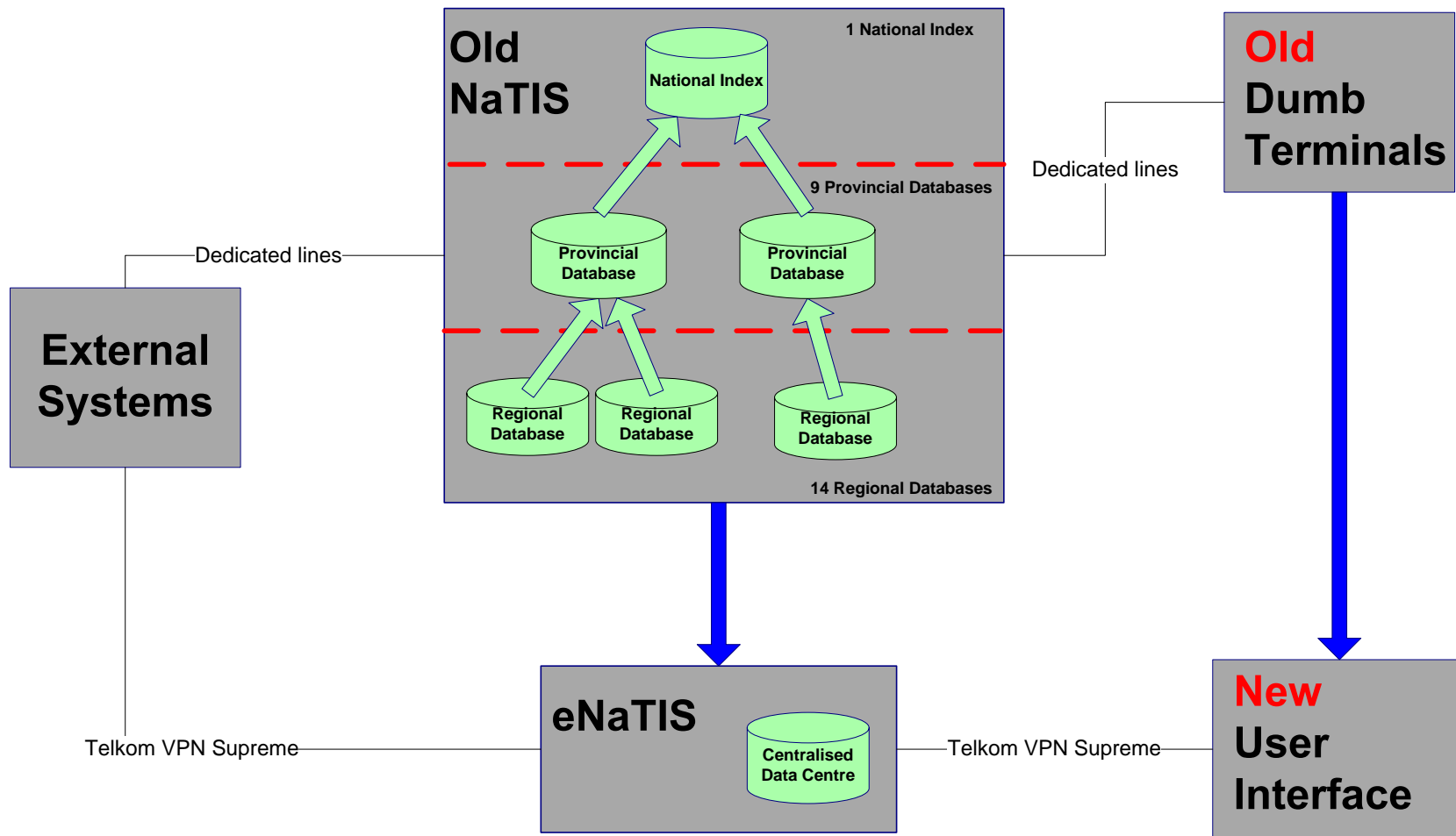
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# Changeover Concept



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# Changeover to eNaTIS

- Data migration of total database
- New hardware platforms (replacement)
- New database technology
- New application software
- New user interface
- New external interface software
- New network (with temporary re-use of portions of old network)



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# Changeover preparation

Old NaTIS – 14 regional servers

eNaTIS – centralised server

Release 76

Specifications Release 76

684 sites with 2000 users

**Tender baseline – June 2002**

9 new releases

Development of Release 76 functionality

Procure hardware and establish data centre

Deploy PCs on sites

Deploy Telkom VPN Supreme networks

9 new releases

Data centre upgrade

Deploy an additional 1000 PCs on 586 new sites

Deploy 3G network

New functionality

Performance testing

Migrate 4.6 billion records and 600 tables

Migrate →

12 data load tests (apply data migration scripts)

← Datafix

Add additional application servers

Serve public

Dry runs  
1 Provincial  
2 National

Hardware upgrade + additional database server





# Changeover

**Old NaTIS – 14 regional servers**

**eNaTIS – centralised server**

**eNaTIS Ready – 4 April 2007**

**Close transactions – queries only**

**Final data migration**

**Shutdown old system**

**eNaTIS Live – 12 April 2007**

**Heavy load database constraints**

**Replace application servers**

**Interventions**

**Add new database server**

**eNaTIS Fully Operational – 8 May 2007**



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# Initial challenges

- Total system (all users) are dependant on sufficient database server capacity
- Overload of single node occurred when spikes were experienced
- As result other two nodes started waiting for overloaded server to respond
- Effect: ALL users experienced slow response times – bottleneck of total database access



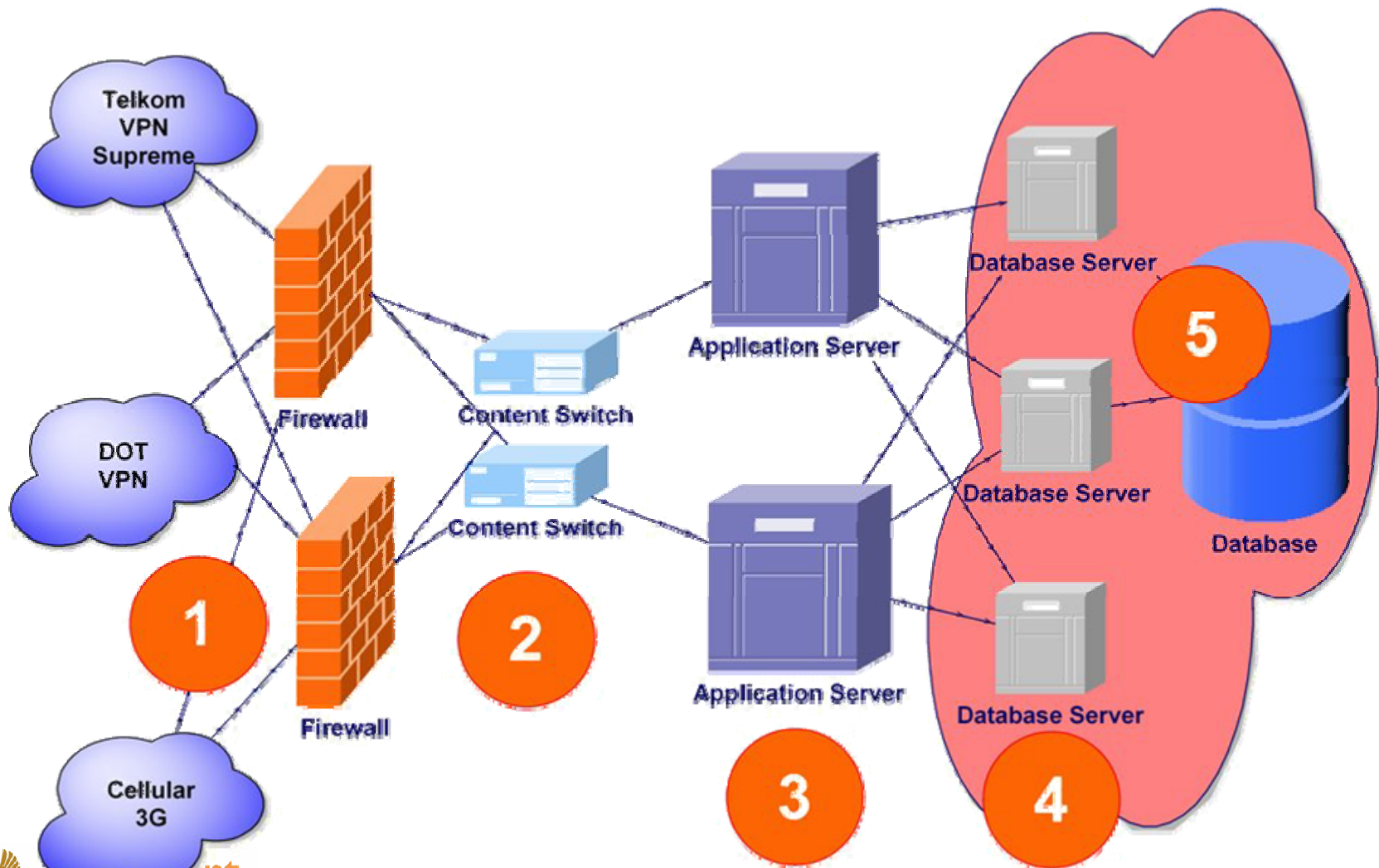
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# Data Centre Constraints





# Interventions

- Installed fourth database server
- Analysed all aspects of Oracle database layers for optimisation
- Optimised and adjusted various settings and physical disk storage parameters



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# Current status

- Old NaTIS performed average of 287,000 transactions per day (Mar 07)
- Between 13 April and 7 May eNaTIS performed average 326,000 transactions per day (13,4% more) with 93% uptime
- After interventions (since 8 May 07) eNaTIS performed average 619,000 transactions per day (115% more) with 100% uptime

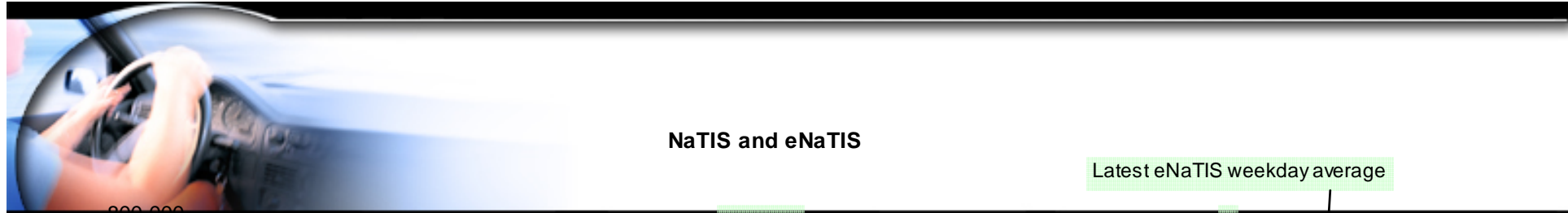


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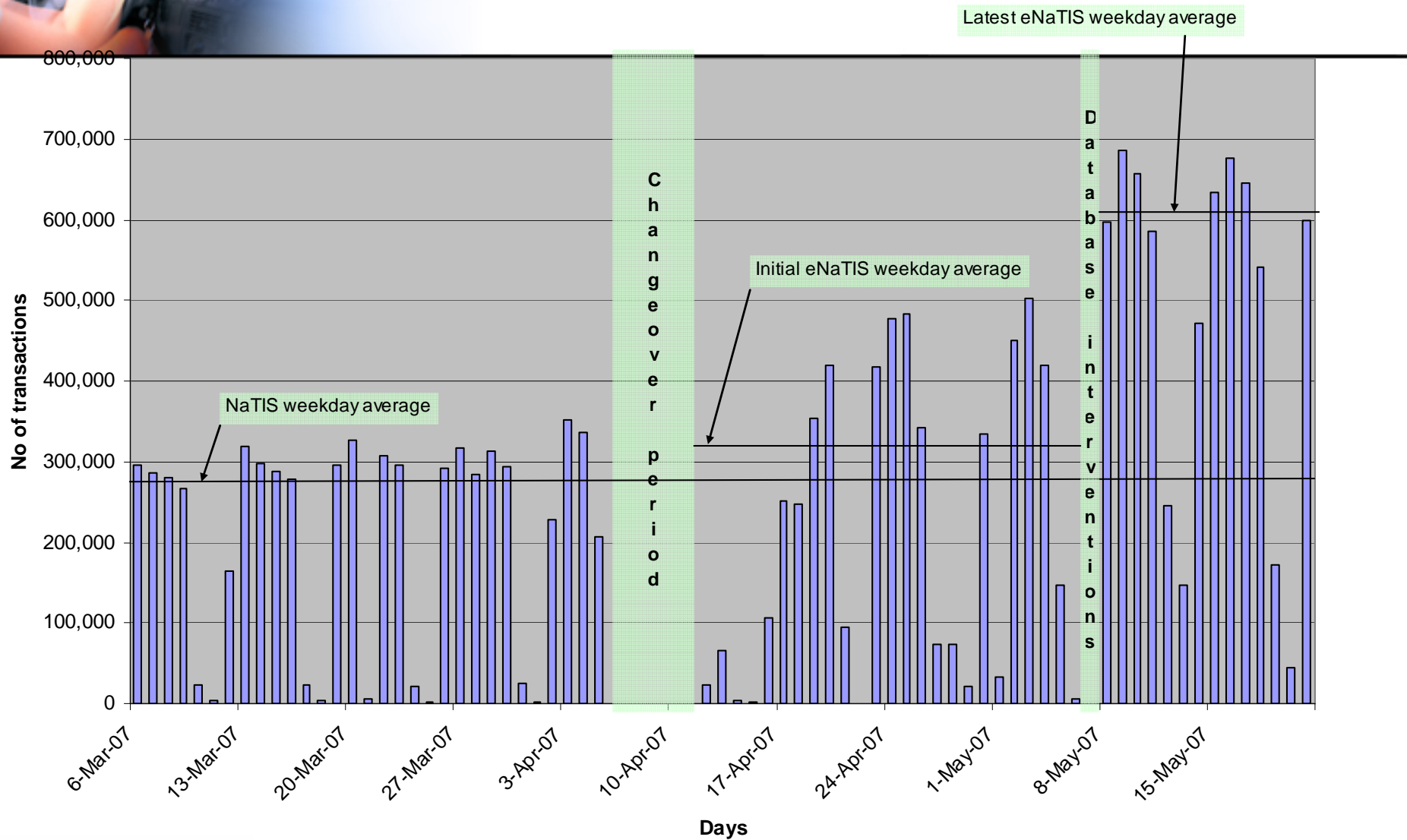
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### NaTIS and eNaTIS



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# Project management

- Project governance model was deployed by internationally recognised company
- Model is based on PMI (Project Management Institute) PMBOK (Project Management Body of Knowledge)
- National Steering Committee governs the project with formal change control
- Full-time project office to perform administration, scheduling and control
- Project health check performed



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# Methodologies

- Project Management: PMBOK
- Software Development: Full implementation of Rational Unified Process (RUP) from IBM
- In final stages of ISO9001 accreditation



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# Project Challenges

- Initial contract award July 2001
- Mission critical system operating in ever changing environment
- Due to system complexity long development cycle
- Since release of original tender specification, 100% growth on all aspects (equipment, sites, software requirements)
- 9 provinces with unique requirements
- At no stage could business continuity be compromised



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# Effects of challenges

- Increase in price for new sites, new hardware and new software
- NOT FOR difficulties in completing original baseline
- Additional requirements on request of provinces and financed by provinces
- Rescheduling of milestones without exceeding initial contract period
- Upgrading of originally proposed hardware



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# Conclusion

- Project was delayed from onset with court challenges
- Massive scope expansions in software requirements, users and sites necessitated rescheduling of milestones
- Capacity constraints were eliminated
- ENaTIS is now stable and performs in accordance with requirements



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