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Enterprise Level Applications on
Windows Azure

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Background

Background

- Technical Manager focusing on 3rd party products and technologies
- Responsible for products to ease integration with these
- Among these are Sitecore Azure
- Sitecore Azure enables seamless integration to Windows Azure



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Building on Windows Azure

Building on Windows Azure

- Any architectural considerations i have to be aware of?
- What are the challenges of building application for Windows Azure?
- Will Windows Azure scale endlessly?
- How difficult is it to convert my existing Application?



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Brief overview of Sitecore CMS

Brief overview of Sitecore CMS

- a Enterprise Content Management System
- designed for endless scaling
- supports multi server and multi location setups
- uses information push forward to high security requirements



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Overall Architectural Considerations

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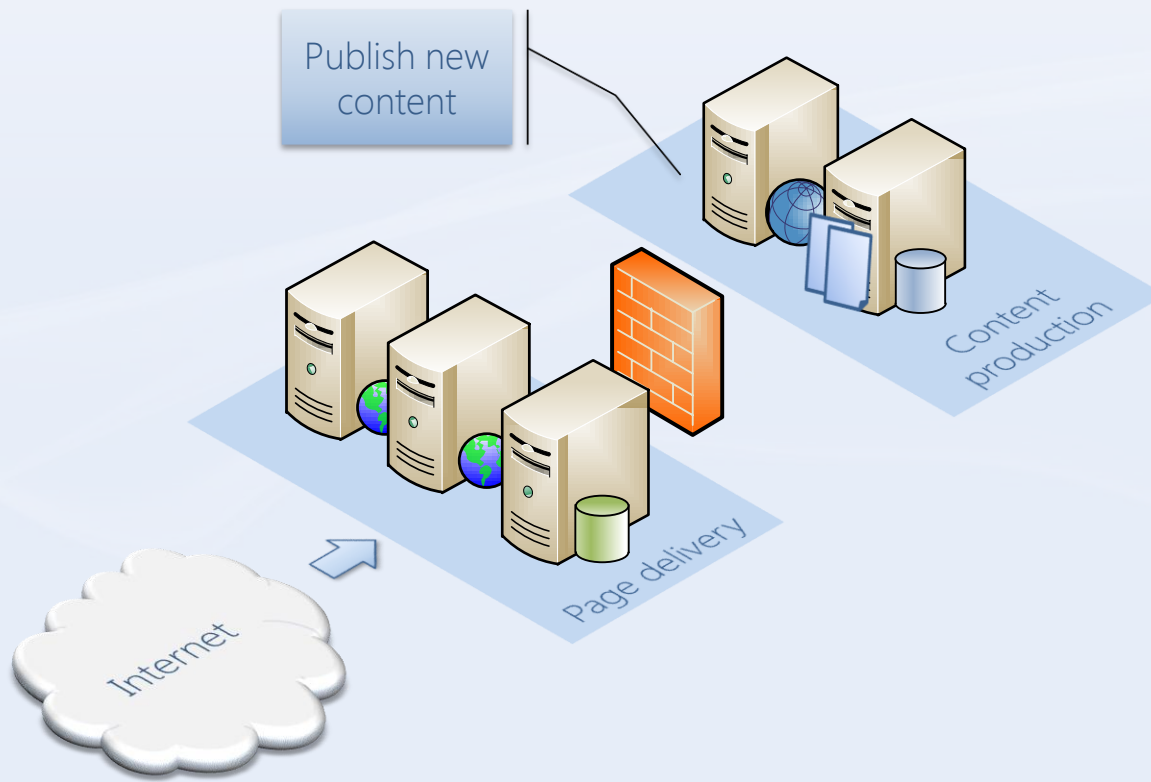
- Runs on shared commodity hardware
- Everything has to be able to scale
- Multiple Geographical Locations
- Address scalability restrictions on single point of access data resources like databases



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Typical setup

Typical setup

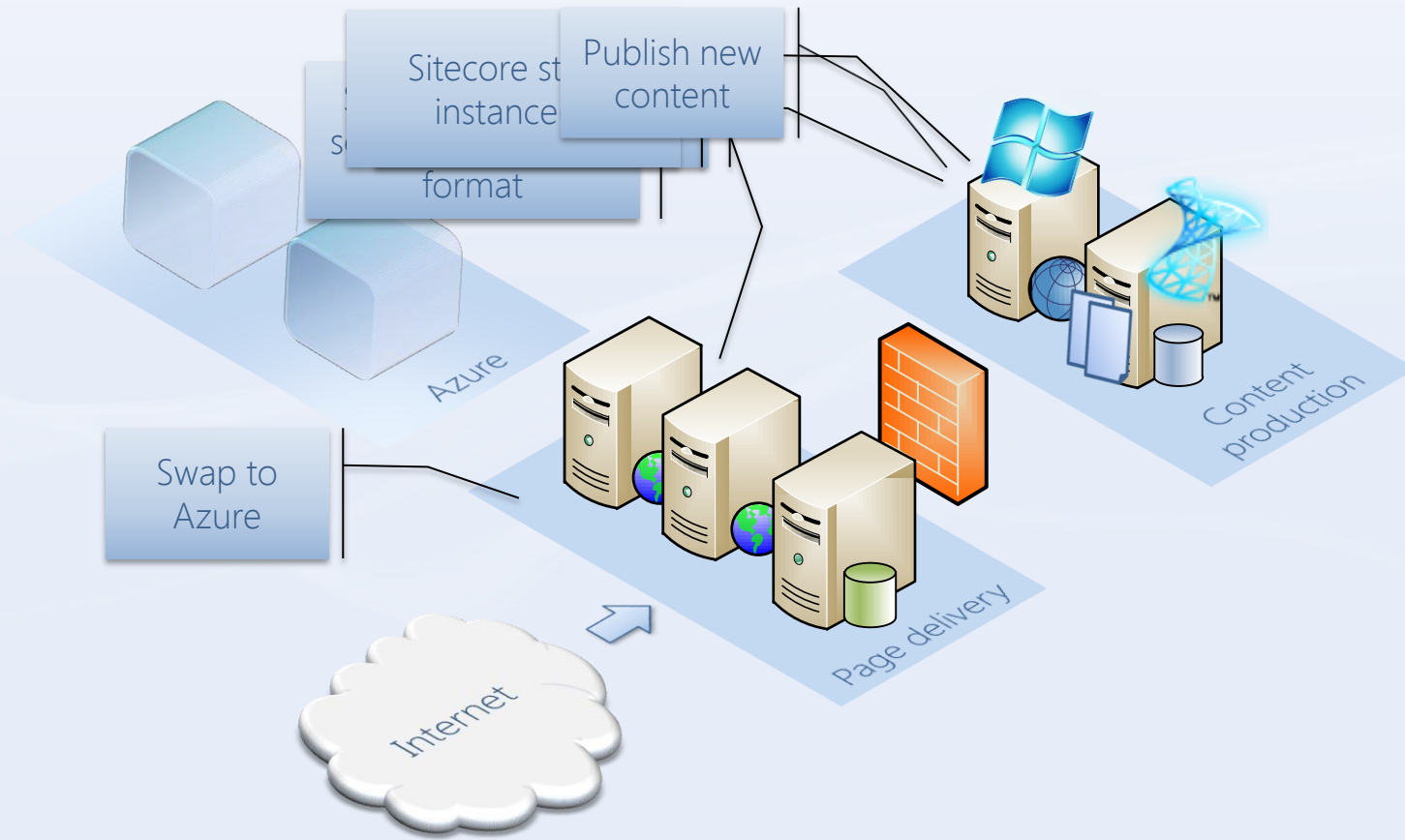




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Sitecore deployment on Azure

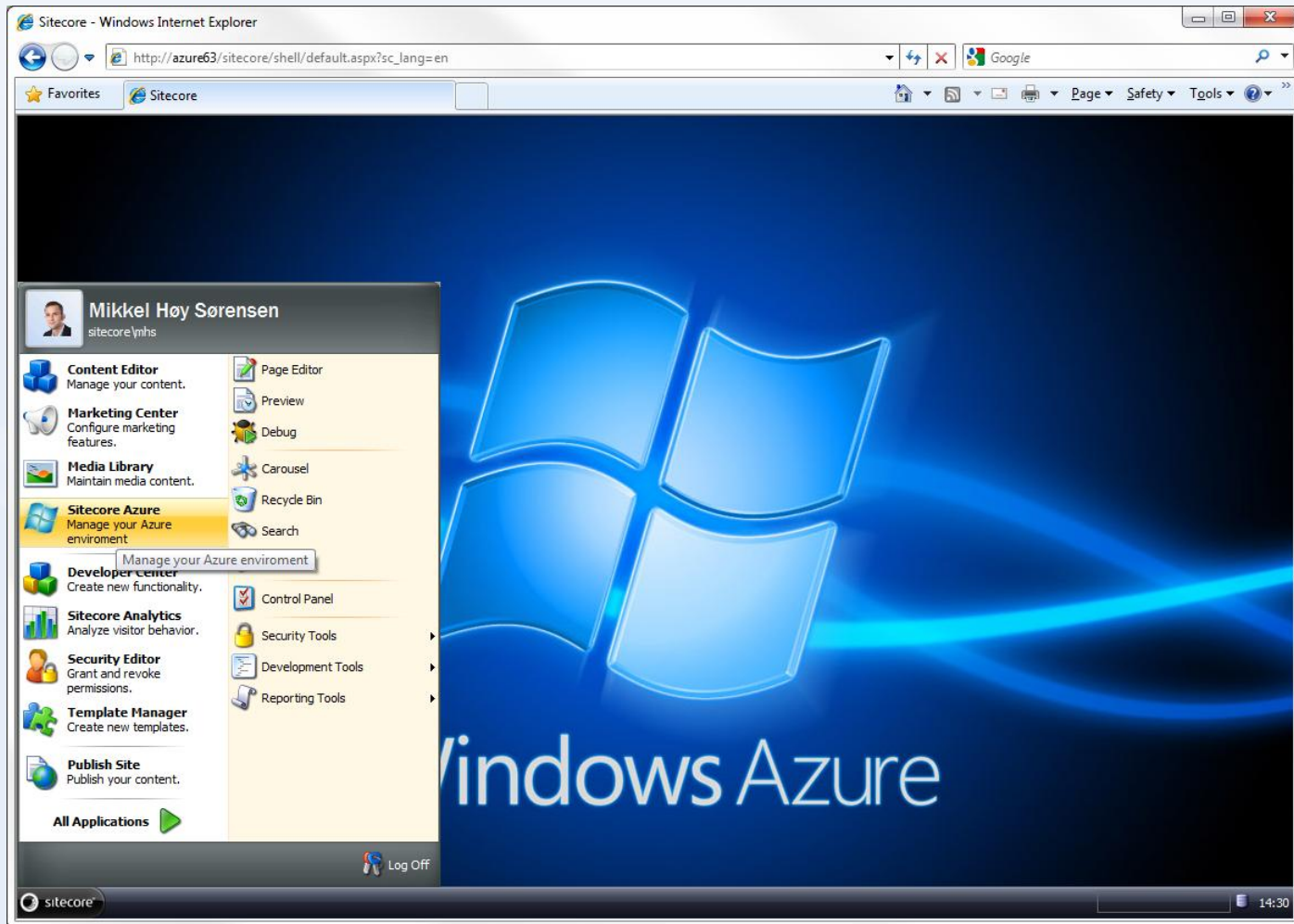
Sitecore deployment on Azure



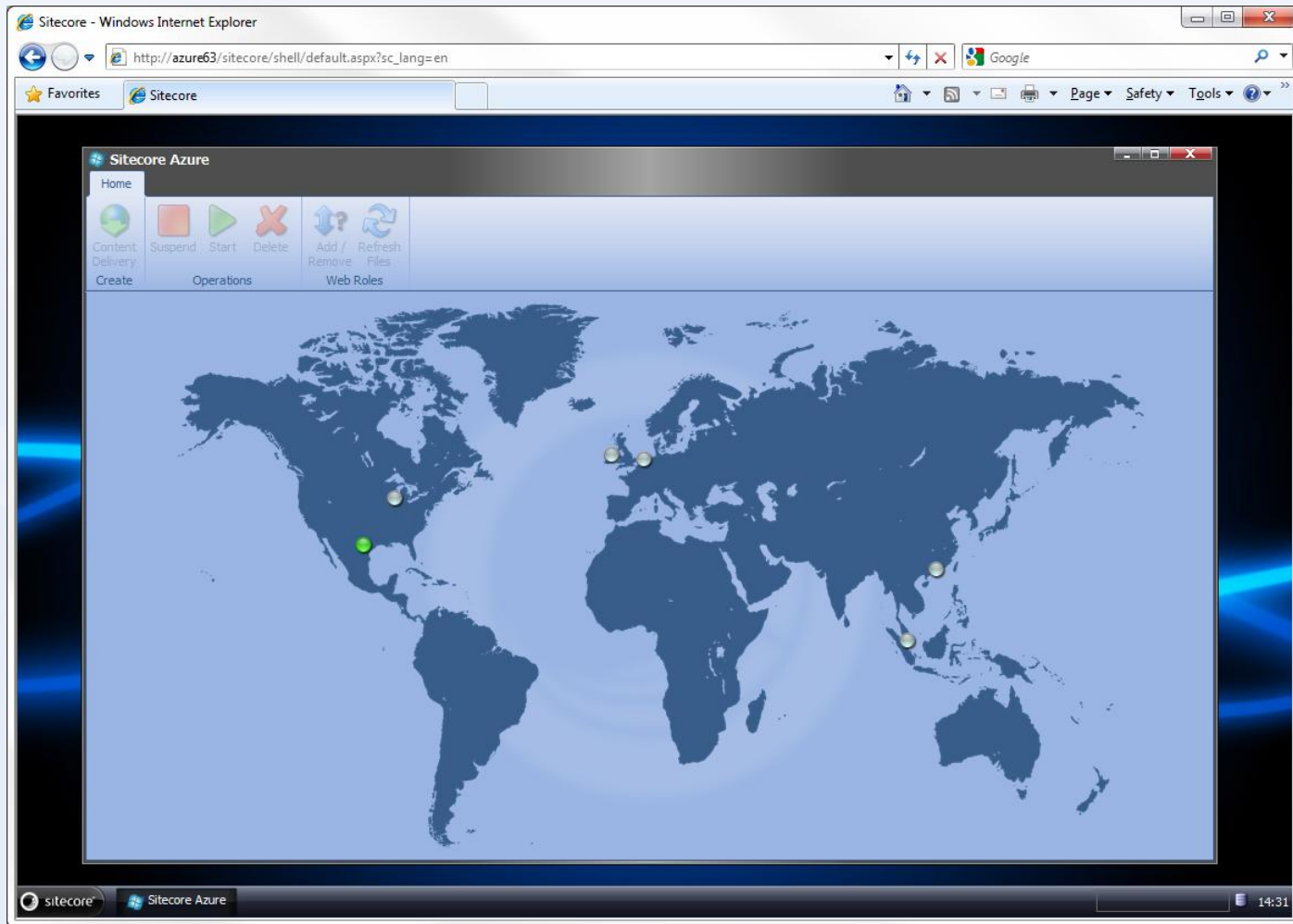
What does the automated deployment do

- Creates cloud databases with published data
- Setup Azure databases as publication targets
- Converts existing Website in to Web Role
- Configures Web Role to run on Cloud databases

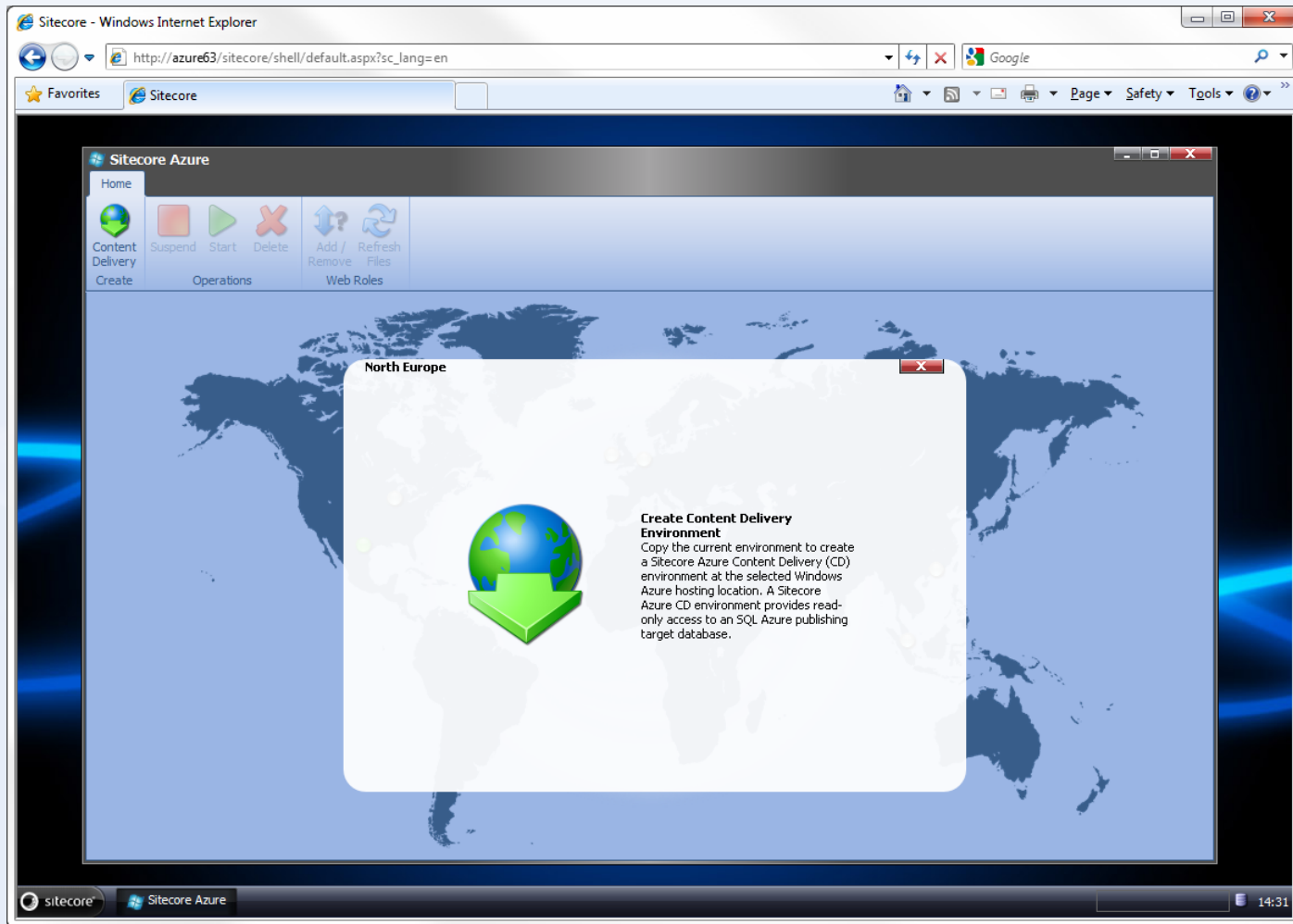
Sitecore Azure Application



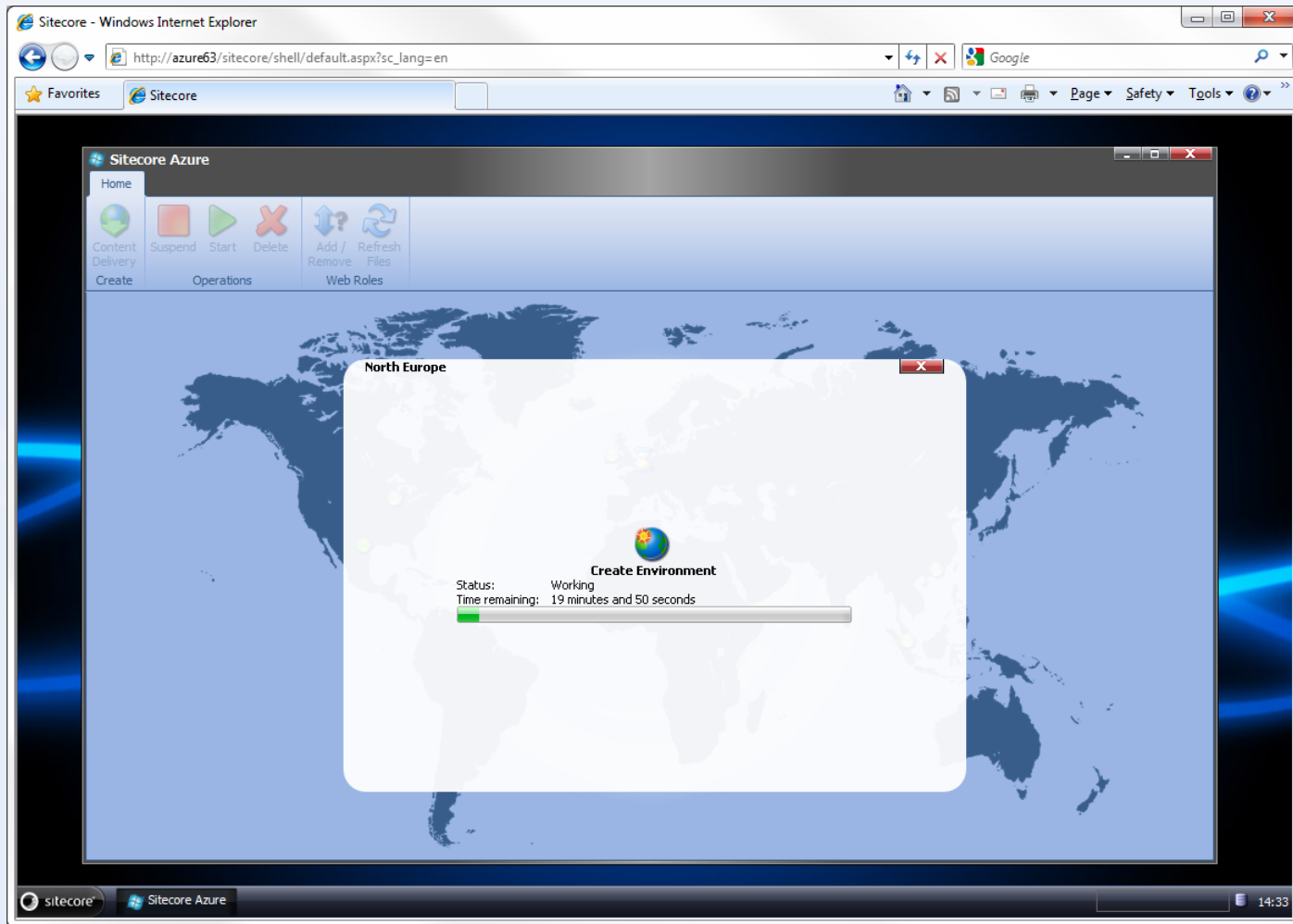
Sitecore Azure Application



Sitecore Azure Application



Sitecore Azure Application



Windows Azure Service Management REST API

- Control hosted services
- Create, update, swap and delete deployments
- Operate and get status on deployments
- Change sizing of environments
- Maintain certificates
- Get information about storage accounts



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Web Roles

Web Roles

- Everything be able ton run multiple instances at once
- Web Roles can at any time be spun up / down, so must be stateless or able to recreate stats
- No disk access
- No support for legacy code

Converting Sitecore to Web Roles

- Sitecore consists of ~31 MB of compiled code
- Supports multiple web instances
- Can recreate state
- Not a single line was changed in order to support the Windows Azure platform
- Only changes done to Web Roles where configuration



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Databases

Databases

- Must have clustered index
- Only one database server location pr. subscription
- No database replication (sync is available)
- Database size limitation



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Latency

Latency

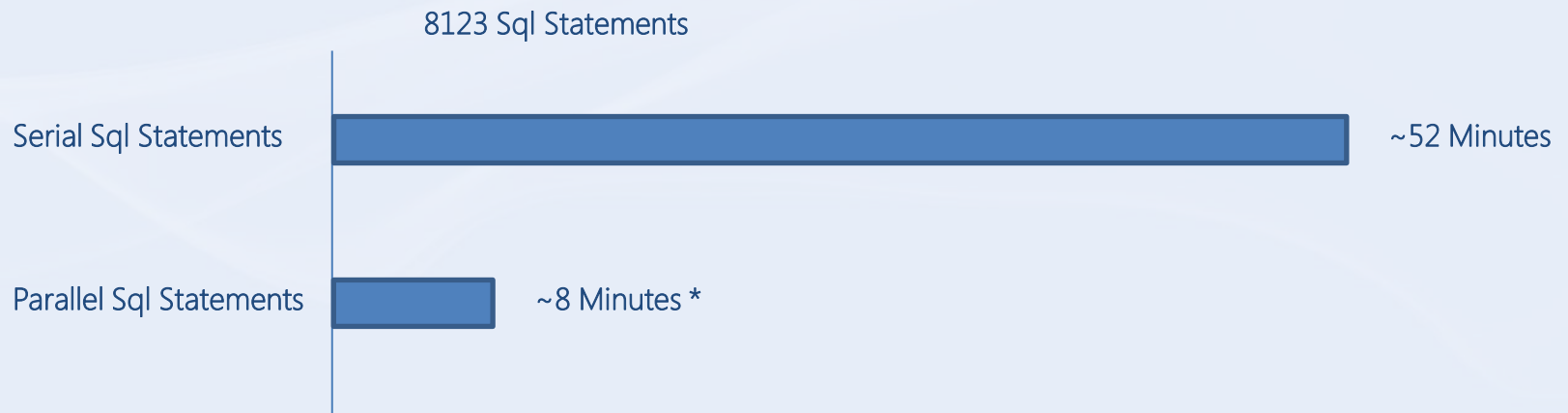
- Database responses from Web Roles where as expected
- Updating or Creating database from on-premise Production servers was slow due to latency
- Utilization of the bandwidth was very poor

Latency

Regional Averages (Averages of groups of city-pairs within the listed region)	Last 12 Months Averages	09/10	08/10	07/10	06/10	05/10	04/10	03/10	02/10	01/10	12/09	11/09	10/09
US	34.37	34.16	34.30	34.30	34.39	34.45	34.09	34.28	34.10	34.45	34.59	34.64	34.74
Europe	13.68	15.79	13.97	13.73	13.90	13.76	13.81	14.04	13.75	13.50	12.74	12.96	12.19
Asia Pacific	63.60	62.34	62.92	64.21	65.80	62.73	62.79	64.12	64.39	61.91	62.01	64.09	65.88
Cala	112.97	108.48	110.08	109.73	112.95	109.35	111.30	114.78	115.19	114.49	117.20	117.33	114.74
Inter Region													
New York to London	78.75	78.64	78.60	78.84	79.08	78.44	79.21	79.03	78.96	77.96	78.83	78.80	78.61
New York to Rio De Janeiro	119.41	110.17	110.18	111.79	110.71	110.39	110.39	120.07	133.60	134.87	126.58	128.29	125.91
San Francisco to Tokyo	99.02	97.68	98.64	96.42	96.00	101.00	96.71	104.61	103.42	96.52	96.27	98.40	102.62
Singapore to Los Angeles	184.51	178.60	177.98	178.18	180.62	178.04	178.20	193.39	189.60	190.39	191.75	189.65	187.74
Tokyo to London	264.06	249.28	253.07	253.05	253.17	260.22	272.11	271.66	267.61	268.35	274.43	272.90	272.85
US (Intra-region)													
Dallas to Chicago	23.54	22.83	22.80	22.59	22.50	22.69	22.52	22.53	22.47	24.74	22.72	24.80	29.28
Los Angeles to New York	68.48	68.10	68.79	68.64	68.92	68.61	68.64	68.65	68.87	68.43	67.95	68.13	68.04
Orlando to New York	35.01	34.79	34.83	34.95	34.90	35.04	34.86	35.01	35.06	35.26	34.92	35.08	35.43
Philadelphia to Denver	39.28	38.95	39.29	39.52	39.61	39.88	39.16	39.20	39.09	39.09	39.03	39.28	39.29
Europe (Intra-region)													
Frankfurt to Milan	11.57	11.19	11.22	11.09	11.17	11.12	11.19	11.09	11.08	14.90	11.38	12.04	11.42
Frankfurt to Stockholm	32.53	27.67								37.39			
London to Madrid	30.23	29.17	30.16	29.14	29.64	29.61	29.72	29.61	31.50	34.20	30.50	29.73	29.84
London to Paris	8.98	9.01	9.14	9.04	9.05	9.07	8.95	8.93	8.91	8.98	8.89	9.01	8.78
Asia Pacific (Intra-region)													
Hong Kong to Sydney	140.87	135.90	136.15	141.58	145.17	135.62	138.71	140.22	141.29	137.10	138.15	148.59	151.96
Singapore to Tokyo	85.90	78.71	83.41	85.19	85.19	83.04	85.37	93.22	84.62	84.08	85.41	89.41	93.16
Taipei to Hong Kong	18.80	19.12	18.67	18.92	18.57	18.56	18.52	19.48	18.51	19.12	18.53	18.77	18.81
Tokyo to Hong Kong	51.10	47.32	51.79	51.65	51.96	52.28	52.89	50.76	50.91	50.90	50.89	50.97	50.89
Latin America (Intra-region)													
Buenos Aires to Rio De Janeiro	31.79	31.29	31.31	31.37	31.57	32.17	31.37	31.28	31.27	31.28	31.29	31.03	36.25
Mexico City to Bogotá	118.78	114.94	124.08	114.99	114.70	115.18	121.89	118.27	117.00	116.79	123.85	125.19	118.49
Rio De Janeiro to Santiago	53.60	52.46	52.58	53.22	52.86	53.79	53.01	53.47	54.86	52.83	52.50	53.22	58.41
Sao Paulo to Santiago	52.81	51.67	51.67	53.34	53.04	51.81	52.07	52.30	53.56	51.83	51.69	53.85	56.88

Latency

- Small 70mb database deployment from Los Angeles to Singapore (avg. 185ms)



* The statement was now limit to bandwidth and server throughput



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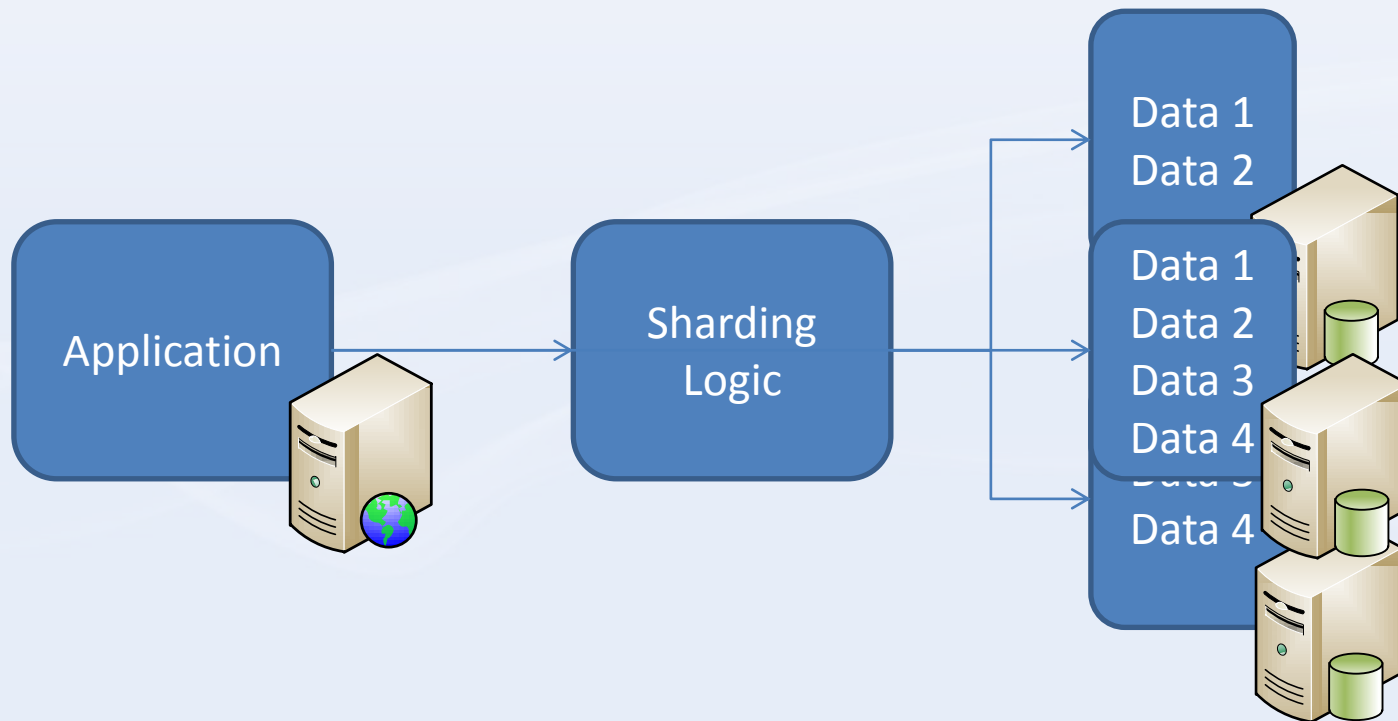
Database Sharding

Database Sharding

- Span your data across multiple databases
- Addresses database space limitations
- Ability to scale throughput
- Cost of 1x20GB is the same as 2x10GB
- Endless database size

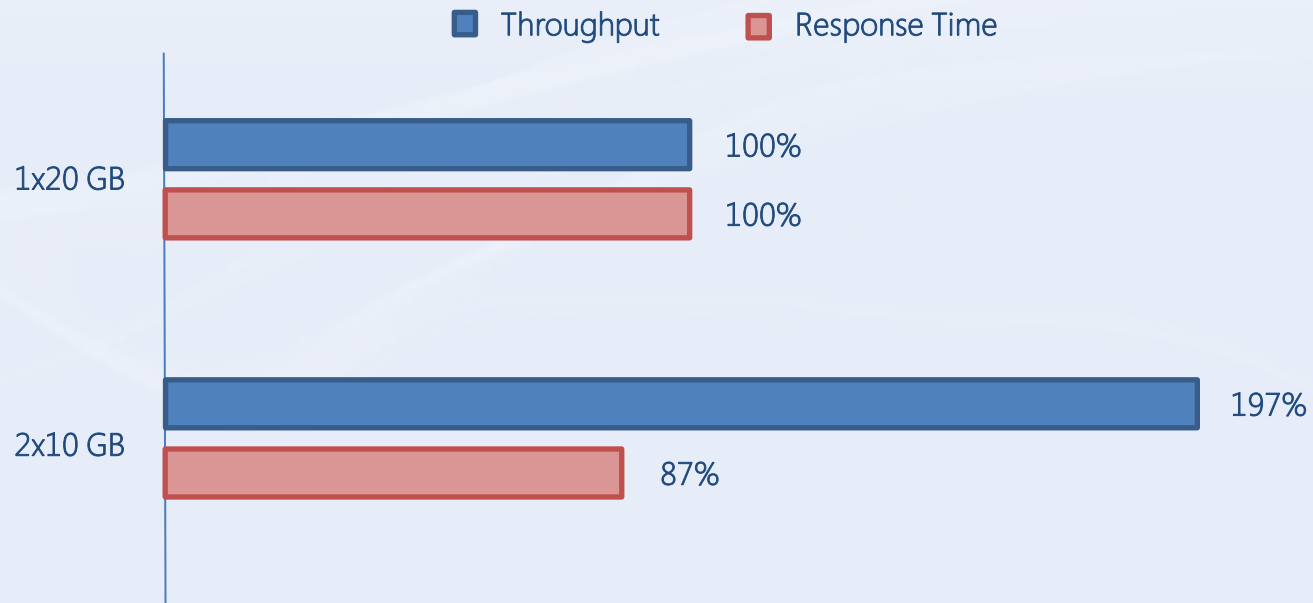
Database Sharding

Principle behind database sharding



Database Sharding

- Scale out to two databases





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SQL Fault tolerance

Fault tolerance

- With software redundancy you can expect the server to close you connection.
- Faults will probably be more frequent when running on WAN then LAN.
- You should add retry capabilities to you application, to remove or reduce this.
- Best Practices for Building Reliable SQL Azure Database Client Applications: <http://sqlcat.com/technicalnotes/archive/2010/06/17/best-practices-for-building-reliable-sql-azure-database-client-applications.aspx>



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Questions?



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