

ARCHITECTING

HIGHLY AVAILABLE

CLOUD INTEGRATIONS

Richard Seroter
@rseroter



HAVE YOU EVER

BUILT A MODEL PLANE?

A row of several glue bottles is shown, with the central one in sharp focus. The bottles are white with red caps and contain a yellowish-orange adhesive. The background is dark and out of focus.

**A GOOD MODEL DEPENDS
ON STRONG GLUE.**



**WE WANT A DURABLE
CONNECTIONS BETWEEN
OUR “THINGS.”**

1 CORE PATTERNS

2 CONFIGURING FOR AVAILABILITY

3 PUTTING IT ALL TOGETHER

1 CORE PATTERNS

2 CONFIGURING FOR AVAILABILITY

3 PUTTING IT ALL TOGETHER

TEMPORARY HICCUP IN NETWORK,
DATABASE, SERVICE, OR ELSEWHERE

OFTEN RESOLVED THROUGH RETRIES

MAY BE HANDLED GRACEFULLY FOR
YOU BY PLATFORM OR SDK

CONSIDERATIONS FOR BUSINESS
NEED, CONTINUED FAILURE,
TRANSACTIONS

RETRY TRANSIENT

FAILURES



LOAD BALANCE

REDUNDANT

INSTANCES

SCALE OUT VIA MORE INSTANCES

ABOUT ACTIVELY USING (HEALTHY)
NODES TO SHARE WORK

APPLIES TO COMPUTE, MESSAGING,
EVENT STREAMING, DATA AND EVEN
NETWORKING

IDEALLY, THIS IS BUILT IN

AUTOSCALING MAKES THIS FEEL
MORE SEAMLESS



**BOTH TRANSACTIONAL AND
METADATA**

**CONSIDER HOW YOU READ AND
WRITE DATA**

**CROSS-REGION REPLICATION IS
POWERFUL, BUT LAGS DUE TO
LATENCY**

**MAY BE AS MUCH ABOUT DISASTER
RECOVERY AS HIGH AVAILABILITY**



REPLICATE YOUR

DATA

ONE USER'S LOAD CAN IMPACT ALL
OTHER INTEGRATION TENANTS

MAY REJECT REQUESTS OR PROVIDE
LOWER QUALITY RESULTS

SHOULD BE DONE IN A VISIBLE WAY



**THROTTLE SOME
OF YOUR USERS**

INTRODUCE LOAD LEVELING

PROTECTS BACKEND SYSTEMS

**MIDDLEWARE GETS BEAT UP, NOT
TARGET SYSTEMS**

**CAN SAVE YOU FROM NON-STOP
AUTOSCALING**

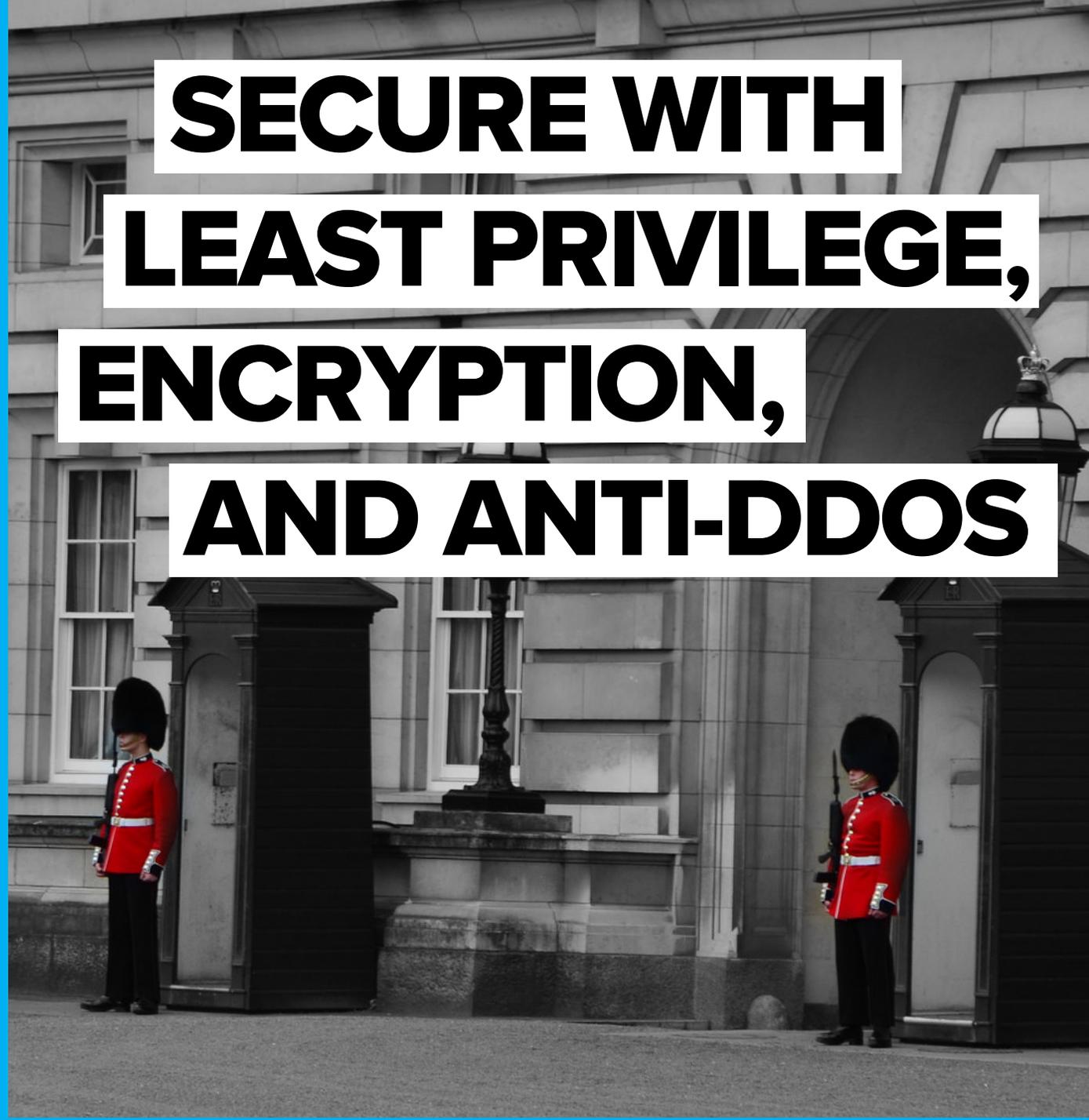


**ACCESS SHOULD BE AS RESTRICTIVE
AS POSSIBLE**

**TURN ON ENCRYPTION WITH EVERY
POSSIBLE SERVICE**

**STAY ONLINE BY PROTECTING
AGAINST DDOS ATTACKS**

**SECURE WITH
LEAST PRIVILEGE,
ENCRYPTION,
AND ANTI-DDOS**



THIS HELPS YOU QUICKLY RESTORE
SERVICE IN A SECONDARY REGION

PROVISION USING REPEATABLE
TEMPLATES AND SCRIPTS



AUTOMATE

BUILD AND

UPDATE STAGES

1 CORE PATTERNS

2 CONFIGURING FOR AVAILABILITY

3 PUTTING IT ALL TOGETHER

AZURE

**STORAGE
SERVICES**

WHAT IT DOES FOR YOU

GET FILE, DISK, BLOB STORAGE

FOUR REPLICATION OPTIONS

LOCALLY-REDUNDANT

ZONE-REDUNDANT

GEO-REDUNDANT

READ-ACCESS GEO-REDUNDANT

OFFERS ENCRYPTION AT REST

WHAT YOU HAVE TO DO

SET REPLICATION OPTION

**CREATE STRATEGY FOR ACCESSING
SECONDARY STORAGE**

**DECIDE ON SERVER AND/OR
CLIENT-SIDE ENCRYPTION**

AZURE STORAGE SERVICES

AZURE | **SQL
DATABASE**

WHAT IT DOES FOR YOU

USES HIGHLY AVAILABLE STORAGE

ABILITY TO SCALE UP OR OUT

EASILY CREATE (AND CHAIN) READ REPLICAS

BUILT IN BACKUP AND RESTORE

INCLUDES THREAT DETECTION

WHAT YOU HAVE TO DO

CREATE REPLICAS

DECIDE WHEN TO SCALE HORIZONTALLY OR VERTICALLY

RESTORE DATABASE FROM BACKUP

TURN ON THREAT DETECTION

AZURE SQL DATABASE

AZURE

**COSMOS
DB**

WHAT IT DOES FOR YOU

99.999% AVAILABILITY FOR READS

**AUTOMATICALLY PARTITIONS
DATA, REPLICATES IT**

**SUPPORTS MULTIPLE
CONSISTENCY LEVELS**

**AUTOMATIC AND MANUAL
FAILOVER**

WHAT YOU HAVE TO DO

**DEFINE PARTITION KEY,
THROUGHPUT, REPLICATION
POLICIES**

**CONFIGURE REGIONS FOR READ,
WRITE, OR READ/WRITE**

**CHOOSE CONSISTENCY FOR DB,
INDIVIDUAL REQUESTS**

**DECIDE TO TRIGGER A MANUAL
FAILOVER**

AZURE COSMOS DB

AZURE

**SERVICE
BUS**

WHAT IT DOES FOR YOU

RESILIENCE WITHIN A REGION

**INITIATES THROTTLING TO
PREVENT OVERLOAD**

AUTOMATIC PARTITIONING

OFFERS GEO-DISASTER RECOVERY

WHAT YOU HAVE TO DO

SELECT MESSAGE RETENTION TIME

CHOOSE TO USE PARTITIONING

**USE PREMIUM MESSAGING FOR
RESOURCE ISOLATION**

**CONFIGURE GEO-DISASTER
RECOVERY**

AZURE SERVICE BUS

AZURE | **EVENT
HUBS**

WHAT IT DOES FOR YOU

HANDLES MASSIVE INGEST LOAD

BUILT-IN PARTITIONING SUPPORT

**AUTO-INFLATE ADDS THROUGHPUT
UNITS TO MEET NEED**

**SUPPORTS GEO-DISASTER
RECOVERY**

WHAT YOU HAVE TO DO

**CONFIGURE INITIAL THROUGHPUT
UNITS**

DEFINE YOUR PARTITION COUNT

**CONFIGURE GEO-DISASTER
RECOVERY**

AZURE EVENT HUBS

AZURE | **LOGIC
APPS**

WHAT IT DOES FOR YOU

IN-REGION HA IS BUILT IN

**IMPOSE LIMITS ON TIMEOUT,
MESSAGE SIZE**

**SUPPORTS SYNCHRONIZING B2B
RESOURCES TO ANOTHER REGION**

WHAT YOU HAVE TO DO

**CONFIGURE B2B RESOURCE
SYNCHRONIZATION**

**CONFIGURE INTEGRATIONS TO
HIGHLY AVAILABLE ENDPOINTS**

**DUPLICATE LOGIC APP IN OTHER
REGIONS**

AZURE LOGIC APPS

AZURE | **FUNCTIONS**

WHAT IT DOES FOR YOU

**SCALES UNDERLYING RESOURCES
AUTOMATICALLY WITH
CONSUMPTION PLAN**

**SCALE VMS AUTOMATICALLY OR
MANUALLY IN APP SERVICE PLAN**

BASIC UPTIME SLA AT THIS TIME

WHAT YOU HAVE TO DO

CHOOSE PLAN TYPE

**SET SCALING POLICIES WHEN
USING APP SERVICE PLAN**

**REPLICATE FUNCTIONS TO OTHER
REGIONS**

AZURE FUNCTIONS

AZURE | VPN GATEWAY

WHAT IT DOES FOR YOU

**DEPLOYS ACTIVE-STANDBY
INSTANCES BY DEFAULT**

**RUN AS A MANAGED SERVICE AND
YOU NEVER ACCESS UNDERLYING
VIRTUAL MACHINES**

WHAT YOU HAVE TO DO

RESIZE AS NEEDED

**CONFIGURE REDUNDANT ON-PREM
VPN DEVICES**

**CREATE ACTIVE-ACTIVE VPN
GATEWAY CONFIGURATIONS**

**SETUP ACTIVE-ACTIVE ON BOTH
SIDES**

AZURE VPN GATEWAY

1 CORE PATTERNS

2 CONFIGURING FOR AVAILABILITY

3 PUTTING IT ALL TOGETHER



**ONLY INTEGRATE WITH
HIGHLY AVAILABLE ENDPOINTS**



CLEARLY UNDERSTAND

WHAT SERVICES

FAILOVER TOGETHER

A photograph of a wrestling ring during a match. Several wrestlers are visible in various poses. One wrestler in the center has long dreadlocks and is seen from the back. Another wrestler on the right has a white cross on his black trunks. The ring is surrounded by a crowd of spectators. The text "REGULARLY PERFORM CHAOS TESTING" is overlaid in the center of the image.

**REGULARLY PERFORM
CHAOS TESTING**

1 CORE PATTERNS

2 CONFIGURING FOR AVAILABILITY

3 PUTTING IT ALL TOGETHER

RESOURCES

NEW PLURALSIGHT COURSE (<https://bit.ly/2sJtzuj>)

MICROSOFT H/A GUIDES (<https://bit.ly/2r2m7lu>)

@RSEROTTER