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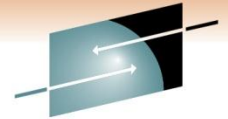
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# Enhanced Migration Control for Oracle's StorageTek Virtual Storage Manager (VSM)

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Oracle Corporation

Thursday March 3, 2011  
Session Number 8892



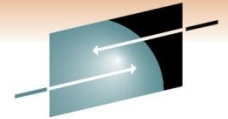


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# Agenda

- The Challenges Users Were Facing
- Introduction
- The VTCS 7.0 and 6.2 Implementation Differences
- What's New In Migration Control?
- Selection and Action
  - With some detail
- Five Examples.

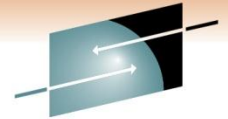
# The Challenges Users Were Facing



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- Poor media utilization
  - Multiple MVCs being shipped offsite with 10% data
  - The most common complaint
  - Why is utilization “poor”?
    - VSM defaults optimizes performance over time
- Desire to control migration sequence
  - Users wanted the remote VTV copy created first
- Desire to delay any migration
  - VSM acts like real tape
  - Active migration prevents reading by an application
- Desire to control removal of VTVs from VTSS buffer
  - Users wanted more control over deletion from the buffer.

# Introduction



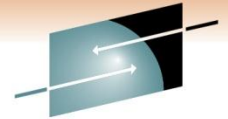
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- Migration Control addresses the four identified issues
- Two new MGMTDEF control statements added:
  - MIGRSEL provides finer control over the number of migration requests allocated to storage classes
    - MIGRSEL allows the user to both limit RTD usage and to increase the priority of migration over other migration
  - MIGRVTV allows better control of VTV migration copies by allowing the user to delay migration
- MIGRSEL and MIGRVTV statements require the VSM Advanced Management feature to be active
  - Note that this is no longer a charged feature
- MGMTCLAS changes made to support finer controls over individual migration copies.

# The VTCS 7.0 and 6.2 Implementation Differences



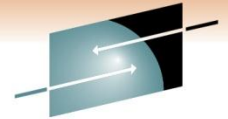
- 7.0 is a complete implementation
- 6.2 is a subset that addresses the most important issue
  - The MIGRSEL Control Statement with the SCHLIMIT parm
- 6.2 requires PTFs:
  - L1H14M8 (SWS620) and L1H14MA (SOS620).



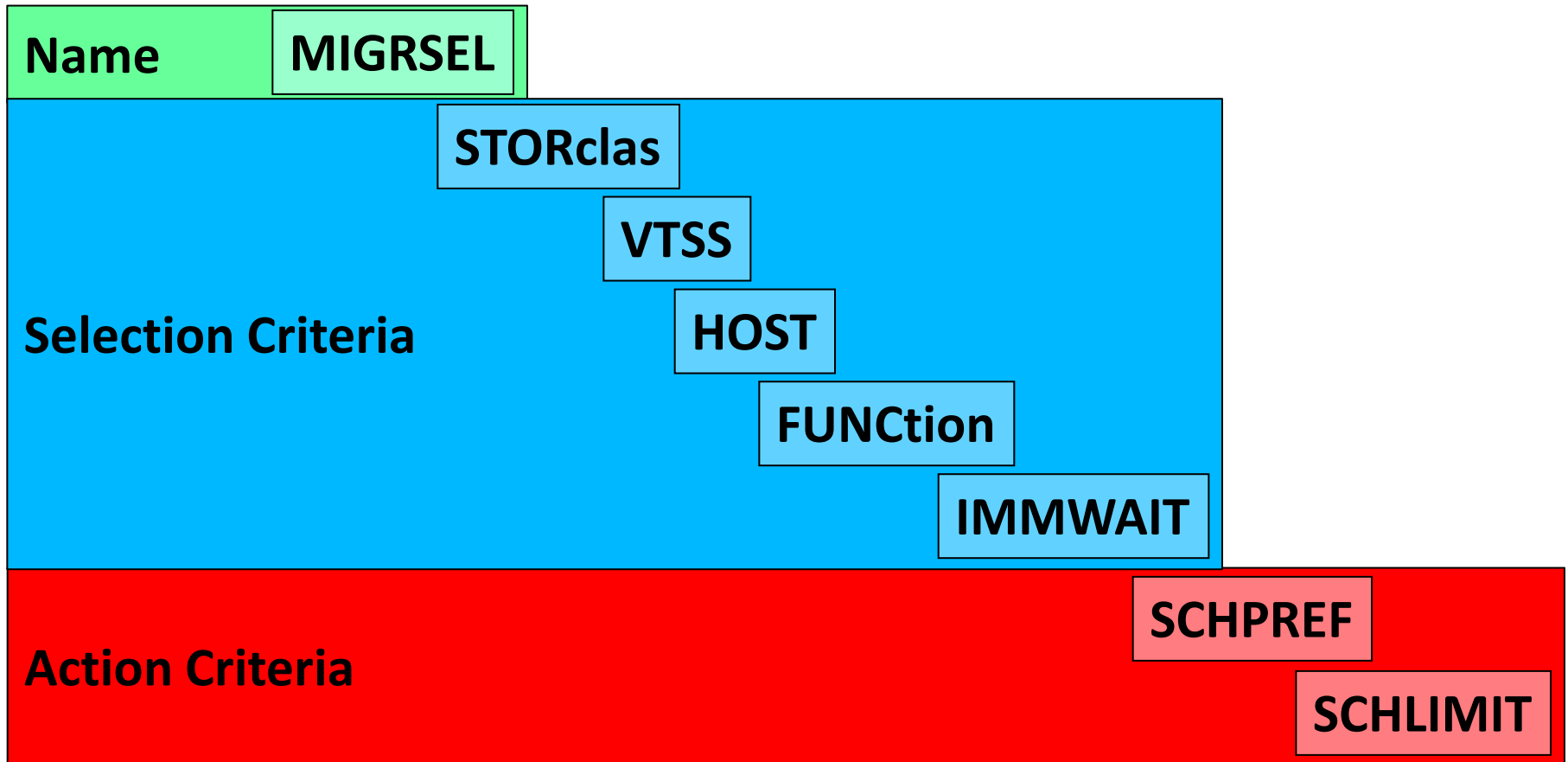
# What's New In Migration Control?

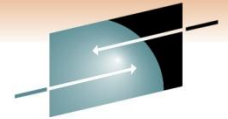
- Two new statements were introduced
  - **MIGRSEL**
  - **MIGRVTV**
- Each of the two new statements has three categories
  - **Name**
  - **Selection Criteria**
  - **Action Criteria**
- Two new parms were introduced in MGMTclas statement:
  - **DISCARD**
  - **IMMDELAY**

# Selection and Action with the MIGRSEL Control Statement



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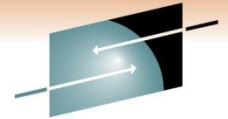


# Selection and Action

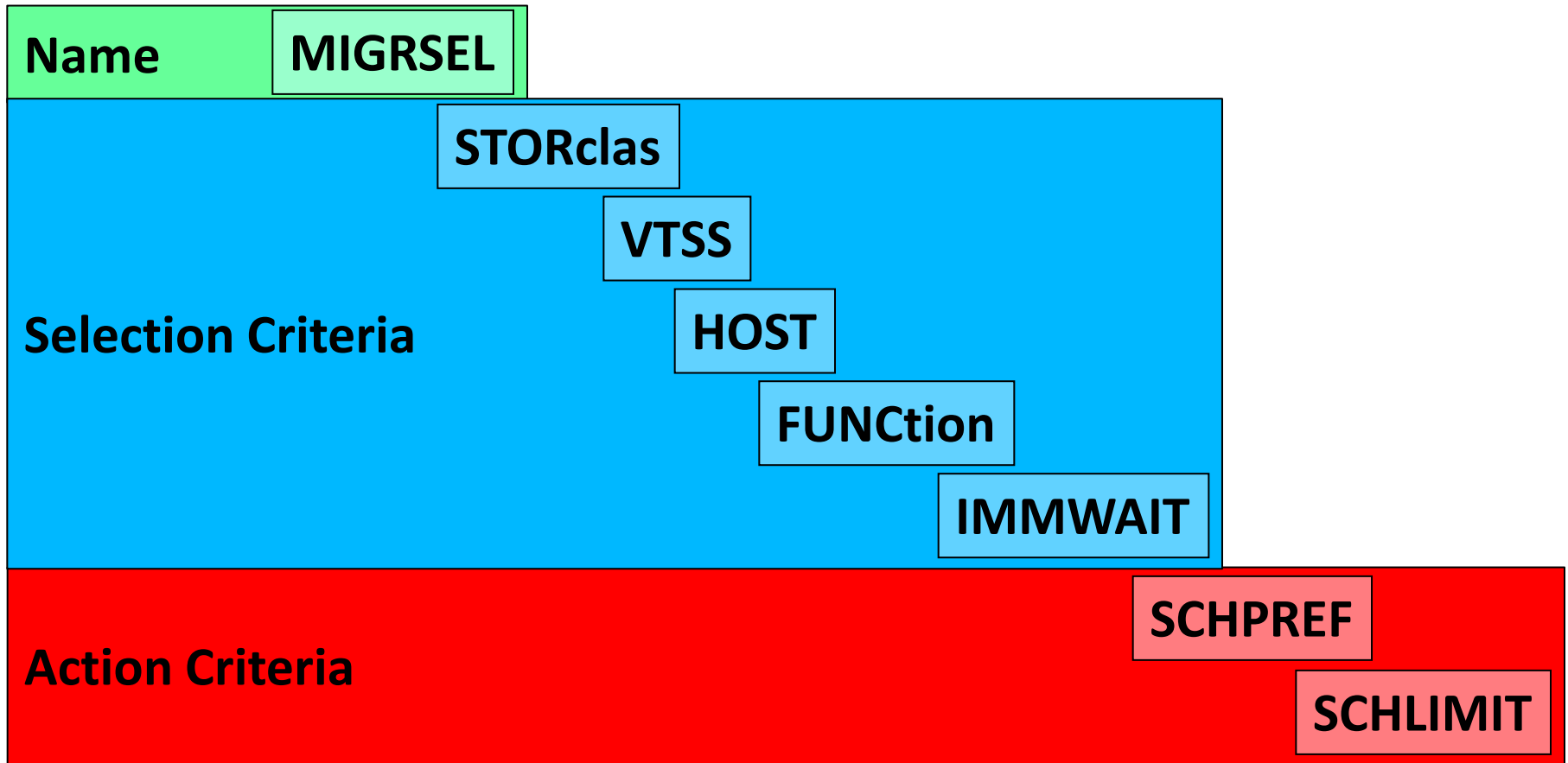
- **Selection Criteria** determines whether or not the statement will action anything
- If all **Selection Criteria** are matched then...
  - All **Action Criteria** are actioned
  - VTCS will **stop searching** Migration Control statements for this set of Selection Criteria
- If all **Selection Criteria** fail to be matched then...
  - No action is taken on this statement
  - VTCS drops thru to the next statement (if any).



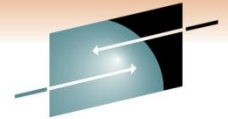
# Selection and Action with the MIGRSEL Control Statement



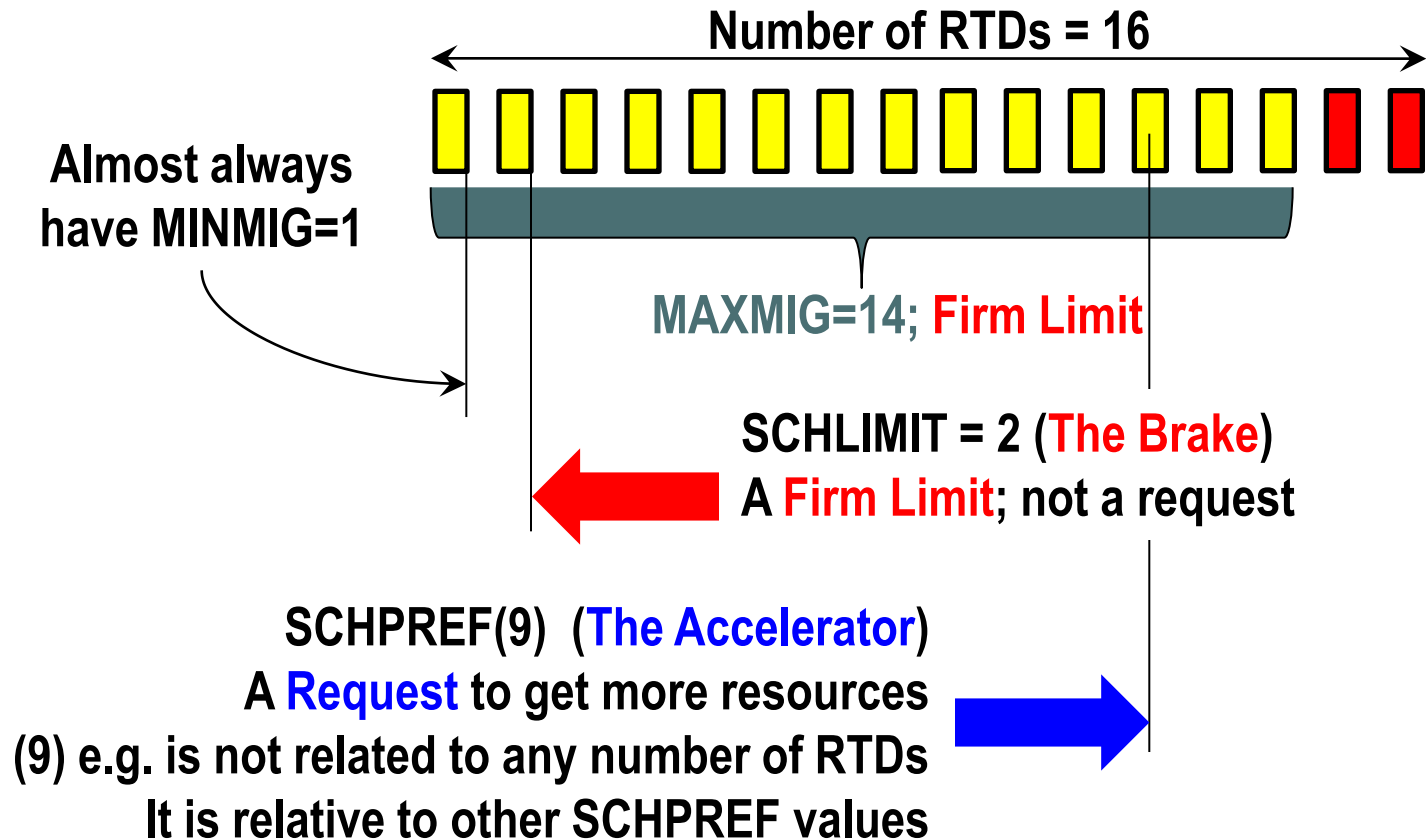
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# The Accelerator and the Brake

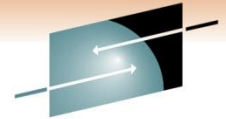


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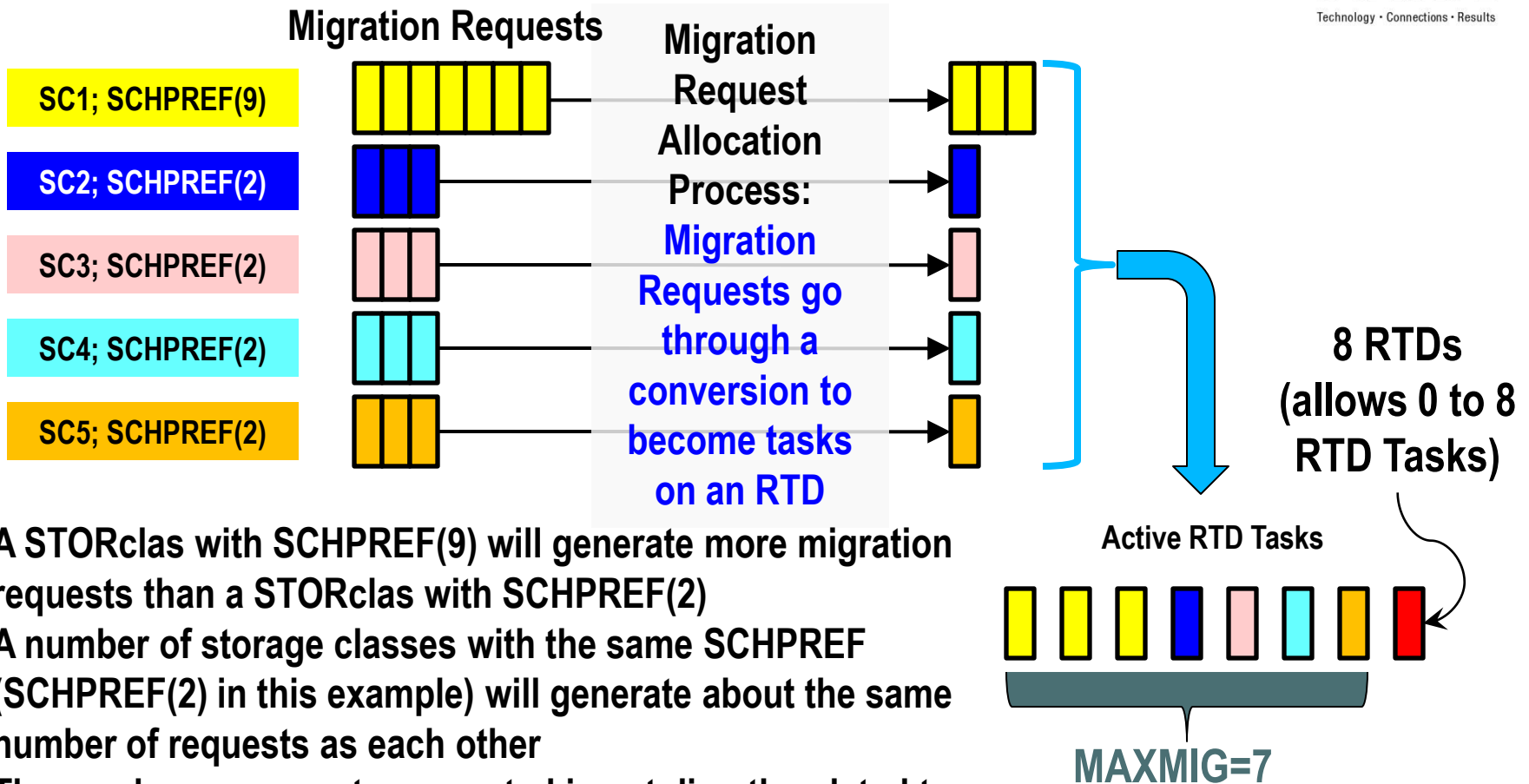


VTSS MINMIG and MAXMIG values remain in effect and maintain (at the overall VTSS level) migration request boundaries.

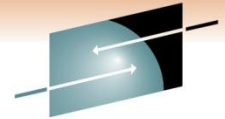
# Workload Converting to Migration Tasks



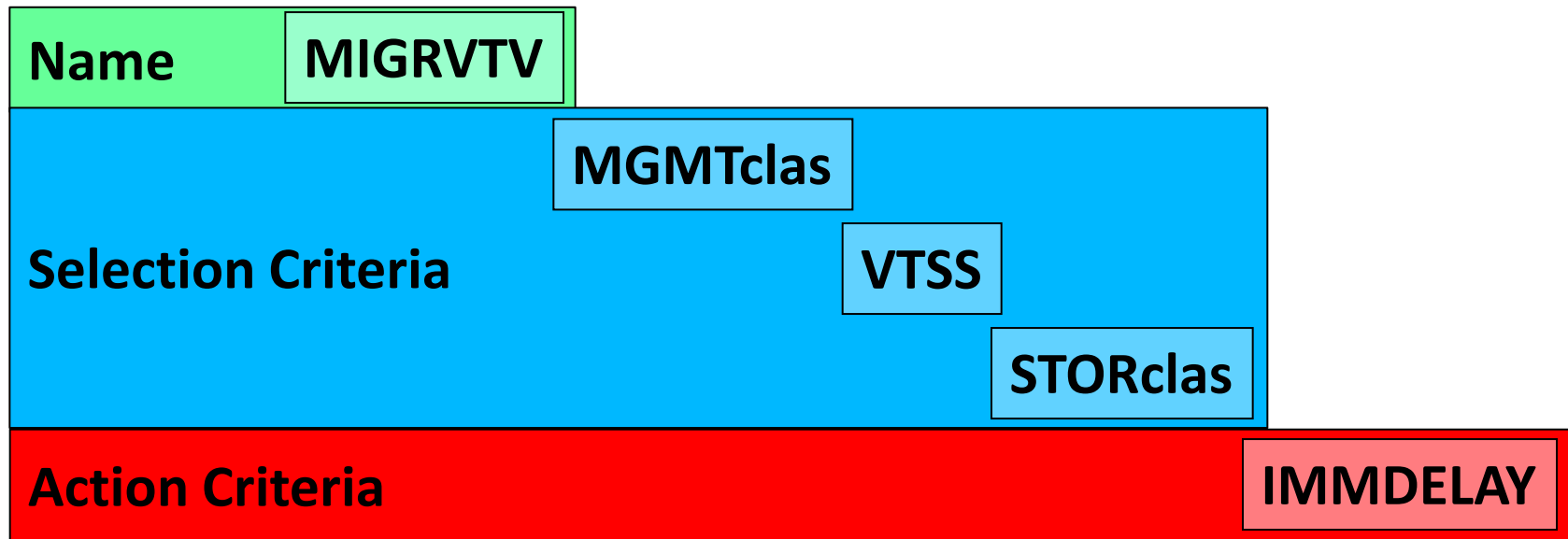
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- A STORclas with SCHPREF(9) will generate more migration requests than a STORclas with SCHPREF(2)
- A number of storage classes with the same SCHPREF (SCHPREF(2) in this example) will generate about the same number of requests as each other
- The number or requests generated is not directly related to MAXMIG
- The STORclas with the higher number of requests generated will generally get more tasks converted over time.



# MIGRVTV Control Statement



# Example 1: Poor Offsite MVC Utilization



- I have about 8 MVCs going offsite each day with demand migration
- Average 15% utilization for each MVC.

**MIGRSEL FUNCTION (DEMAND) SCHLIMIT (1)**

- Only applies to demand migration
- Applies to all hosts, all VTSSs and all storage classes
- Governed by how much time available for backup process.

## Example 2: Using SCHPREF



- I want to give two storage classes (S1 and S4) a higher priority than two others (S2 and S3)
- I want to differentiate between these two higher priorities (S1 and S4) as well.

```
MIGRSEL STORclas (S1) SCHPREF (6)
```

```
MIGRSEL STORclas (S4) SCHPREF (4)
```

- S2 and S3 use the default value for SCHPREF, which is 0.

# Example 3: Conditional Statements

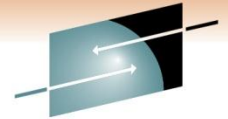


- If any immediate migration is occurring, I want to hold all demand migrations
- If no immediate migration is occurring, I want to limit demand migration to 4 migration tasks (RTDs).

```
MIGRSEL FUNCTION(DEMAND) IMMWAIT(0) SCHLIMIT(4)  
MIGRSEL FUNCTION(DEMAND) SCHLIMIT(0)
```

- SCHLIMIT(0) is not specifically covered by the manual
- SCHLIMIT(0) means **do not start migration for this STORclas.**

# Example 4: Conditional Statements



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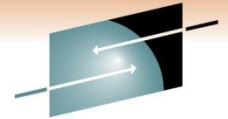
- I want to use VTSS MINMIG/MAXMIG values and SCHPREF(0) for allocating migration requests to storage class S1 until immediate migration wait times age beyond 20 minutes
- After that I want to influence VTCS to create more migration requests for storage class S1.

```
MIGRSEL  STORCLAS (S1)  IMMWAIT (20)
```

```
MIGRSEL  STORCLAS (S1)  SCHPREF (6)  .
```



# Example 5: MIGRVTV Statement



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- I want REMOTE migration to happen immediately
- I want LOCAL immediate migration delayed 5 minutes.

```
MGMTCLAS NAME (PROD) MIGPOL (LOCAL,REMOTE)
```

```
MIGRVTV  STORCLAS (LOCAL)  IMMDELAY (5)
```

```
MIGRVTV  STORCLAS (REMOTE) IMMDELAY (0)
```

..



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