

HSI Configuration/Tuning

Michael Gleicher

<http://www.sdsc.edu/Storage/hsi/Install>



HSI Package

- ◆ *hsi.version.tar.Z*
 - CYGWIN – rpc,kerberos,pdksh
 - ai_threads
 - api_extensions
 - ndapi client library
 - ndapi server
 - ndapi/include/*hpss_version/*.h*
 - hsi
 - htar (LLNL version)

HSI Configuration

Non-DCE Components

All:

compflags.xxx

api_extensions library

restricted ports

ndapi library

default authentication method(s)

keytab

dce combo

kerberos

kerberos_preexist

ident

local

gsi

ndapi authentication configuration

◆ Example (LLNL)

```
DEFAULT_AUTH_TYPE="API_AUTH_TYPE_KRB_PREEEXIST,API_AUTH_TYPE_IDENT,API_AUTH_TYPE_KERBEROS"
```

Kerberos:

```
service name: "hpss_ndapid" (ORNL,NERSC,SDSC)  
              "ftp" (others)
```

```
requires KDC (or dce registry) principal entry and  
keytab entry (/krb5/v5srvtab) to acquire usable  
service ticket
```

ndapi authentication configuration – kerberos env

◆ NDAPI-specific environment variables for KERBEROS authentication (client side)

– KRB_KINIT – path to kinit program (v4 vs. v5 kinit on AIX)

– KRB_SERVICE – e.g. *“ftp”*

– HPSS_PRINCIPAL – *user@realm*

NDAPI/API_EXTENSIONS

Environment Variables

- ◆ **HPSS_PRINCIPAL** (may be a template name, e.g., "%U")
- ◆ **HPSS_AUTH_METHOD** (dce,ident,kerberos,keytab,local,gsi)
- ◆ **HPSS_KEYTAB_PATH** (may include template chars)
- ◆ **HPSS_HOSTNAME**
- ◆ **HPSS_CTL_HOSTNAME**
- ◆ **HPSS_SERVER_HOST**
- ◆ **KRB_KINIT**
- ◆ **KRB_SERVICE**
- ◆ **HPSS_PFTPC_PORT_RANGE**
- ◆ **RPC_RESTRICTED_PORTS**
- ◆ **HPSS_TCP_WRITESIZE**
- ◆ **HOME**
- ◆ **HPSS_PATH_ETC**

HSI Environment Variables

- ◆ HSI_NOLOGIN_FILE
- ◆ HPSS_HOSTNAME
- ◆ HPSS_STRIPE_WIDTH (IHCP, ndapi method)
- ◆ HPSS_BLOCKSIZE (IHCP, ndapi method)
- ◆ HSI_LOGFILE (may include template chars)
- ◆ KRB5CCNAME (Kerberos)
- ◆ PFTP_CONFIG_FILE (

NDAPI Server

- ◆ Configuration files (COS, MOTD, HPSS.conf)
- ◆ -H vs. HPSS_HOSTNAME (diagram of SP with HSI onboard)



HSI I/O Overview

IOD I/O (normal "put"/"get")

local file

Ready queue

o=0
l=8M

o=8M
l=8M

o=16M
l=8M

o=8M
l=8M

transfer thread

o=12M, l=2M

transfer thread

o=0M, l=4M

transfer thread

o=4M, l=4M

local file thread

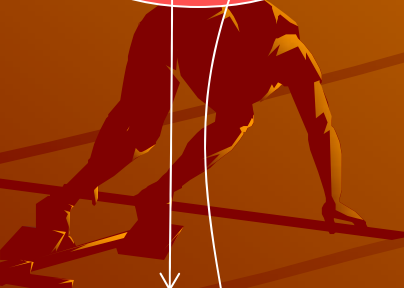
free

e

free

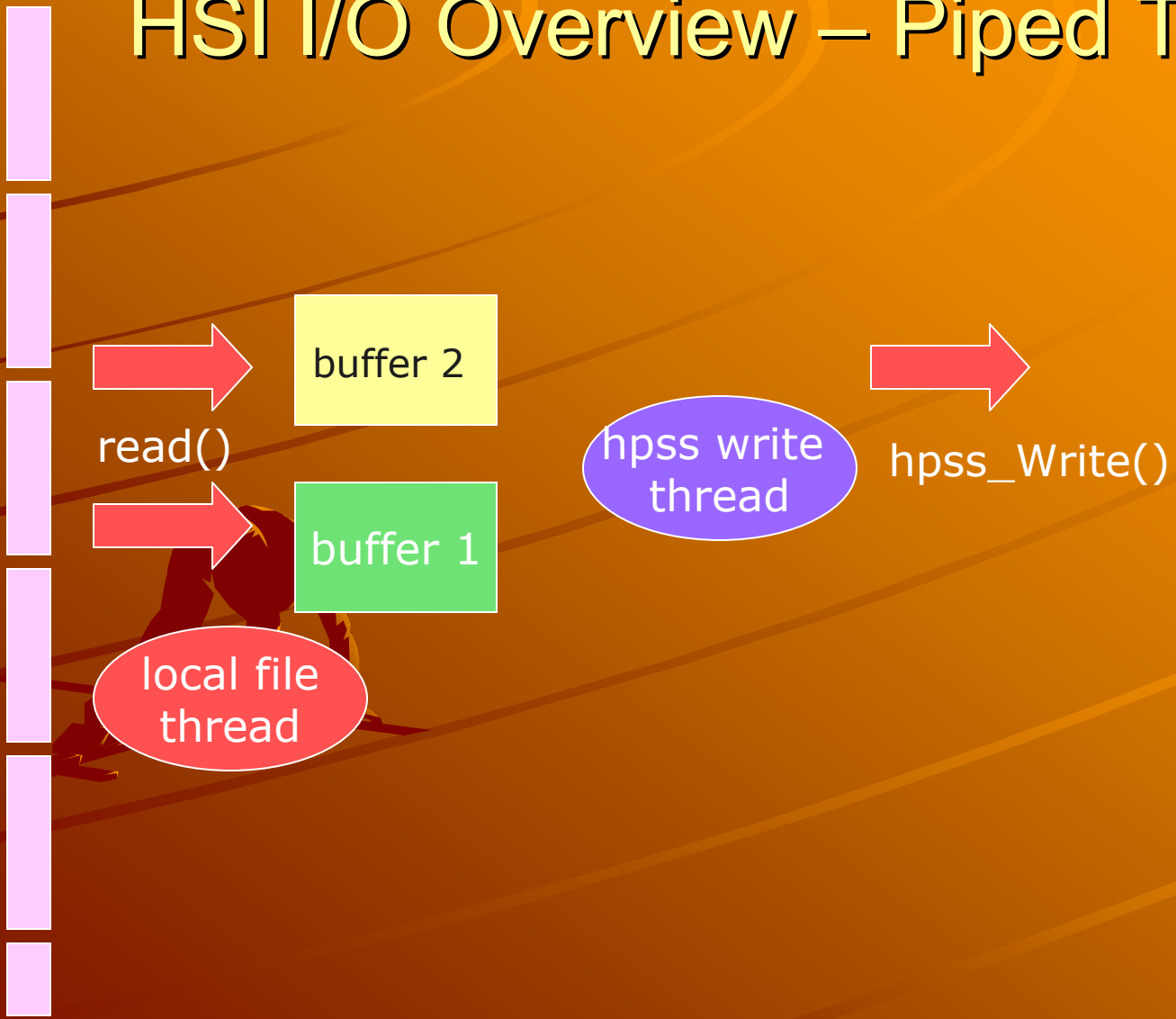
e

listen thread



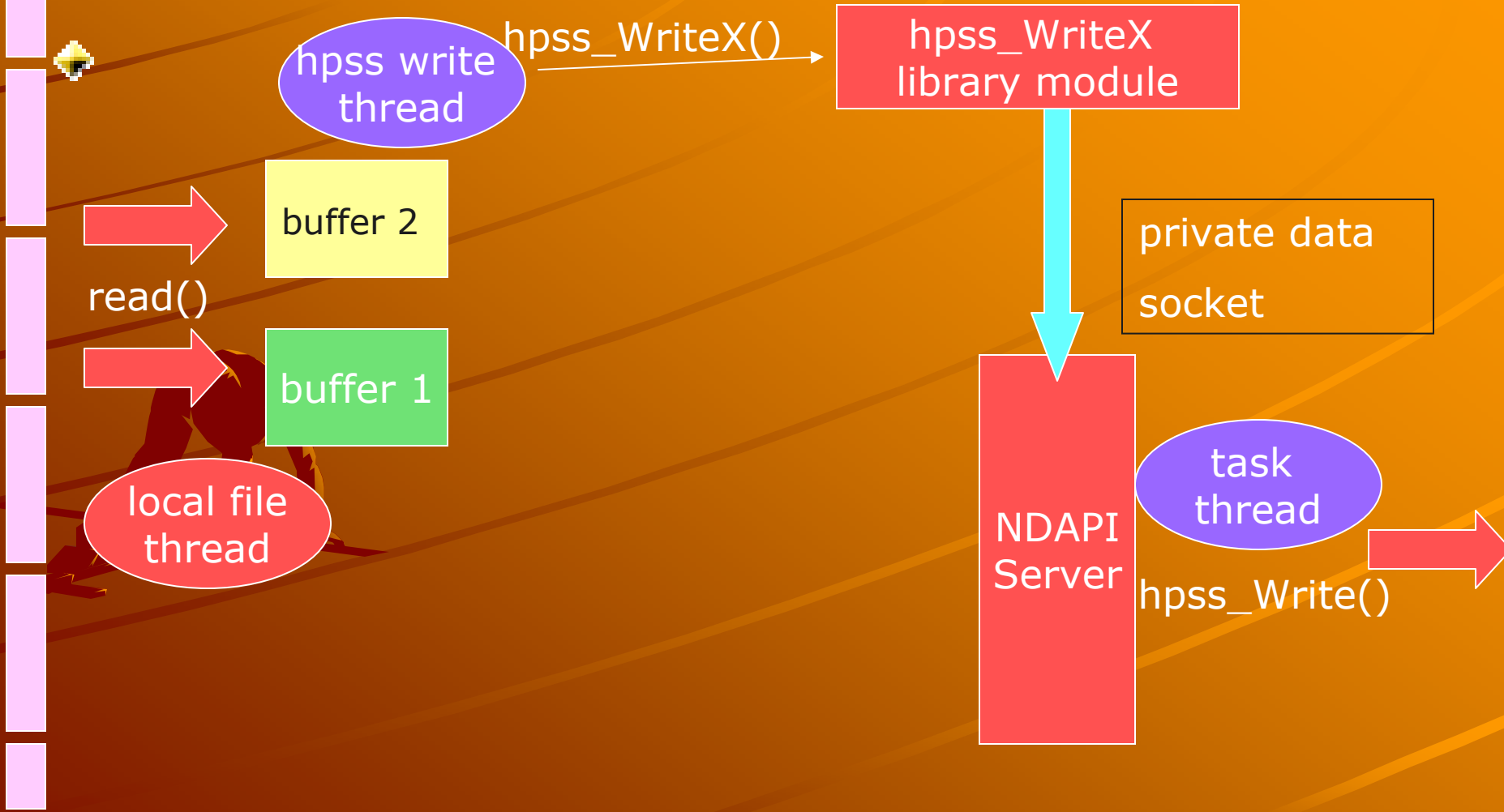
local file

HSI I/O Overview – Piped Transfers



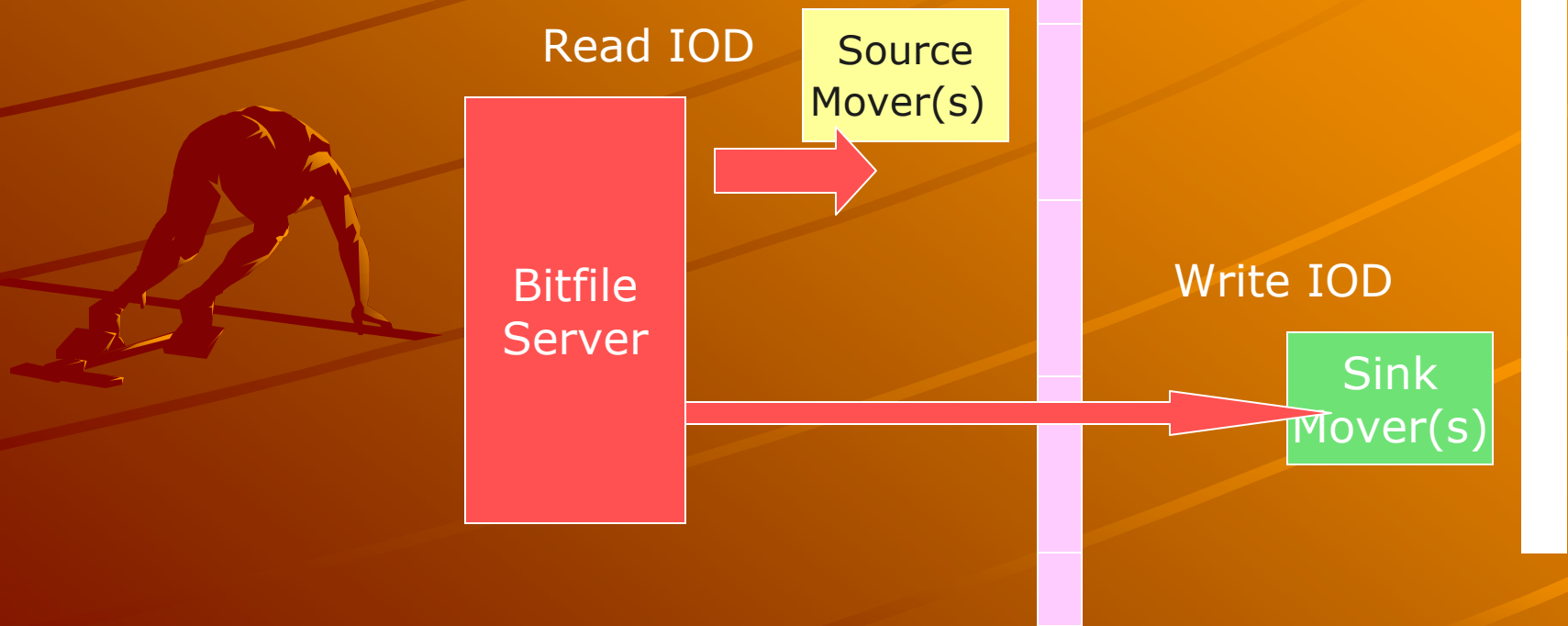
local file

HSI I/O Overview – “Firewall” Mode



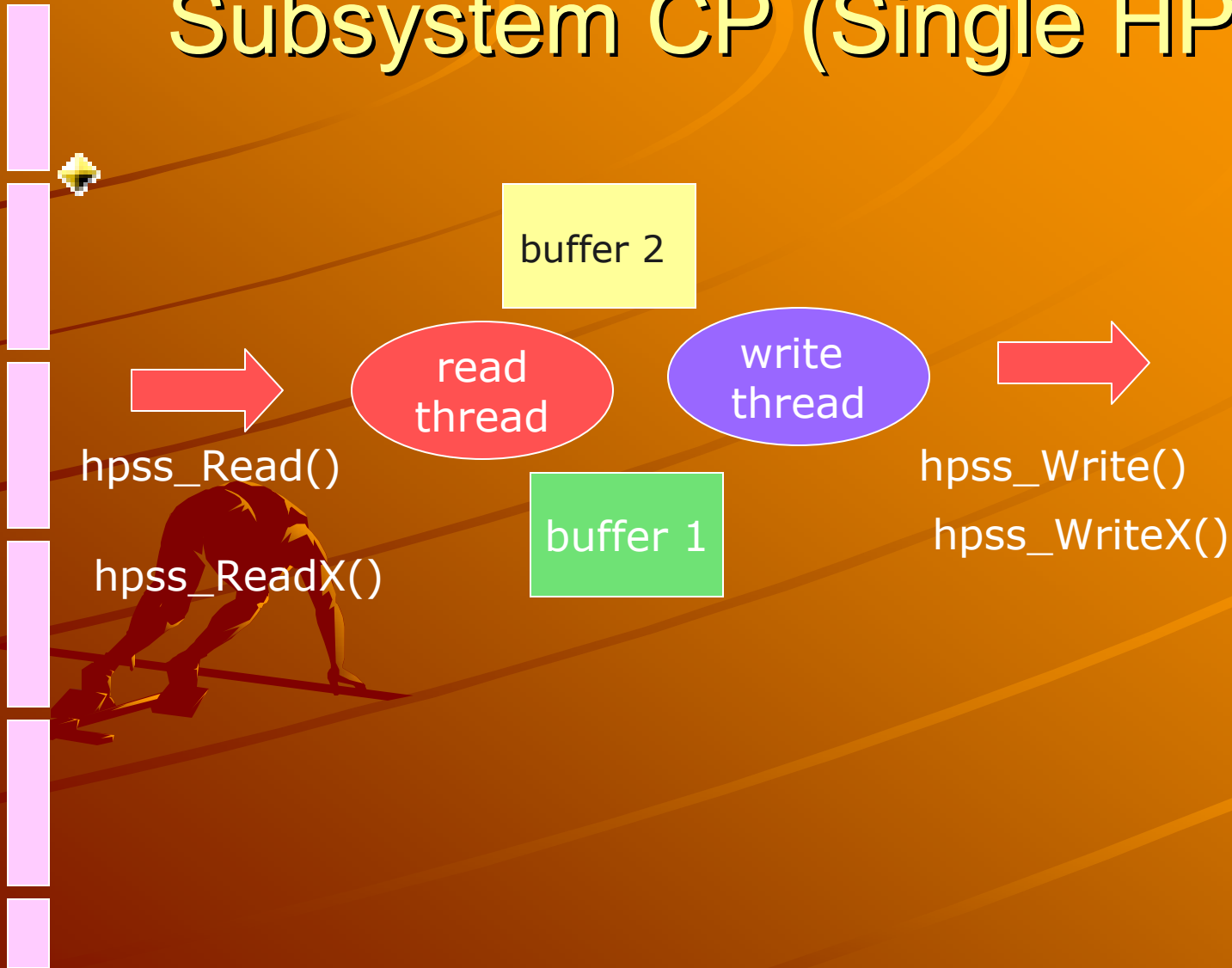
HSI I/O Overview – Intra-Subsystem CP

◆ hpss_CopyFile()

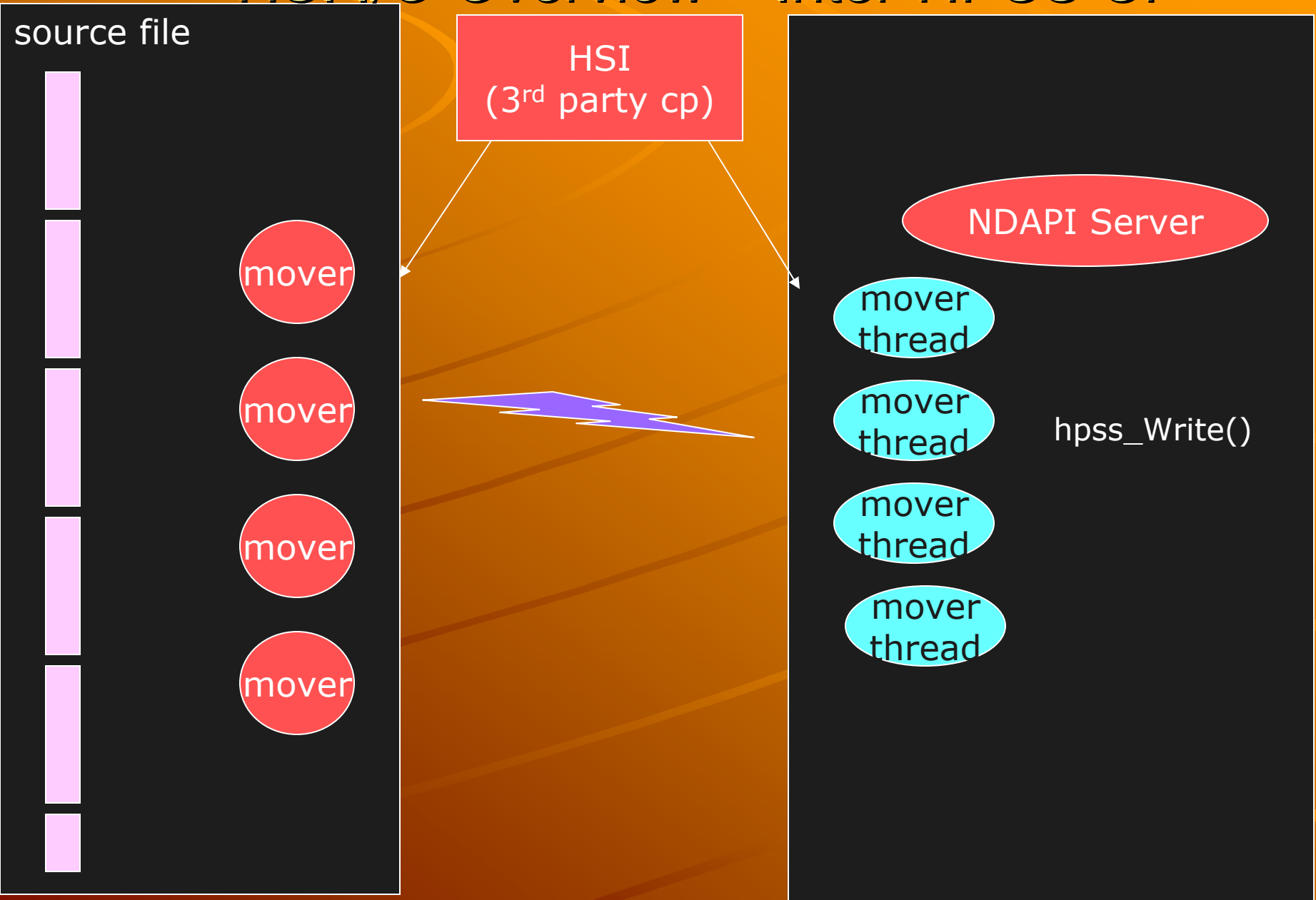


HSI I/O Overview – Inter-Subsystem CP (Single HPSS)

HPSS file



HSI I/O Overview – Inter-HPSS CP



HSI Performance Considerations

- ◆ Determine optimal network options (HPSS.conf)!! (Server/client)
- ◆ Selecting correct NIC for HPSS_HOSTNAME
 - PFTP_CONFIG file for multiple striped NICs
- ◆ Set HSI default buffersize (compile-time, "iobuf" cmd, hsirc (future))
- ◆ Matching HSI/Mover buffer sizes
- ◆ Enabling shared mem
 - admin max shmem (Solaris, SGI (?), ...)
- ◆ Choosing optimal VV blocksize
 - too large-> inhibits parallel xfers

Multi-HPSS

- ◆ multiple NICs
- ◆ multiple sockets
- ◆ ndapi server buffer size

