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7RZDUGV D 7LPHO\&DXVDI@UW(Q\$QDU SULVH

'U 0X =KDQJ

3RVWGRFWRUDO \$VVRFLDWH

'HSDUWPHQW RI &RPHS X&RHU@ @IOH8QLYHUVLW

)ULGD\ 0DUFK WRDPW5QR RQJLQHULQJ %XLOC

\$EVWUDFWLQFUHDVLQJO\ VRSKLVWLFDFWHG \$DWDQDFHNGV 3KIDYHL VEMH
D VHULRXV FKDOOHQJH IRU HQWHUSDOQDHO\VLWH FZKULFW\WSDWVNDV NP XFC
UHODWLRQRVSV EHWZHHQ ILOHV DQGRSHURQFMMVDQ@ GRQVGRXH
WKH ILUVW VWHS WRZDUGV XQGHUVWURSLQJ \$37 UHWV B@NM VD CGL
FDXVDOLW\ DQDO\VLV LV D WLPH FURLVHFIDQPEDXV@QLWW VLVDHFWL
H[WUDFW XVHIXO DWWDFN LQIRUPDWISRQRLQ ZRWNLFLV@LPPLOQHGJL
QHGG ([LVWLQJ DSSURDFKHV KDYH ODOJ@SHRQXMQFL HRVQ VSRWQDC
WR WKH DWWDFN EXW IDLO WR GLOHUYHQWLVWUHR @CGX SHULR XVLWLL
EHQLJQ DQG FRPSOLFDFWHG V\VWHP RSHVWIDJDLRLQV WHPM ODVQLQV @R
7R DGGUHVV WKLV SUREOHP ZH SURSRVHR @ZD @GUD@XVH@O LDVE DFN
DXWRPDWLFDOO\ SULRULWLJHV WKHGLSHYHQWHLQJDLVLR QQRW @H@RUWPE
6SHFLILFDOO\ WR ULWMLR@V DWKHV WUHR @GHQWLWZ/H UDRUHQ HVV DQG
IHDWXUHV LQ WKH FDXVDOLW\ JUDSRQTRIGRFWLRQJ@D@KVXQXNR DHO
TXDQWLI\ WKH UDUHQHVV RI HDFK HYRQW@EZIGL@FK@OR@SR@Q@D@FR@PI@R
DFWLYLWLHV LQ FRUSRUDWH FRPSXWHU@V\VLQHPV@OLH@H@F@S@H@PH@Q@W@
DUHIHUHQFH PRGHO EXLOGHU LQ . @IRXUVVRR@OYED @R@S@R@H@Q@J@Y@
LQ D UHDO HQWHUSULVH ,7 HQYLURQPH@EWO@ZLKH@H@2@6Z@H@Y@R@Q@V@H@F@V@
PDFKLQHV LQ RQH ZHHN ([SHULPHQW@D@ @D@Q@X@D@S@W@X@K@R@Z@W@W@D@W@N@3@
DUH PLVVHG E\ H[LVWLQJ WUDFNHUV D@S@G@W@R@H@V@Z@R@H@R@W@G@H@U@D@Q@D@O@P@D@L@J@C

%LRX =KDQJ LV D 3RVWGRFWRUDO \$VVRFLDWHUL@F@W@K@H@F@H@S@D@U@W@R@
8QLYHUVLW\ ZRUNLQJ ZLWK 3URI (ODL@Q@H@R@S@X@W@H@W@H@F@Q@L@Y@H@R@D@K@L@L@V@
(QJLQHHULQJ IURPH@V@V@D@W@X@V@E@G@Y@L@V@H@G@L@E@Q@ 3%R@I@R@U@H@Q@R@Z@Q@L@Q@J@ &R@U@Q@H@
WZR \H@D@U@V@D@V@D@U@H@V@H@D@U@F@K@V@W@D@I@P@H@P@E@H@V@H@D@W@F@K@(&@Q@D@E@W@H@S@F@W@V@L@E@D@H@
DVSHFWV RI @RPSXWHU 6HFXULW\ D@L@Q@K@H@V@L@W@H@S@D@H@V@F@X@F@L@O@V@U@O@R@E@Q@O@V@
&\EHU 3K\VLFD@ 6\VWHPV 6HFXULW\ DQ@G@Z@R@Q@W@H@K@L@S@V@L@V@H@H@Q@7@S@6@X@E@F@O@L@V@
&&6 &&6 1'66 1'66 1'66 S@U@H@V@H@W@L@J@L@Q@R@X@K@H@F@R@Q@J@H@I@D@H@R@Q@F@R@
VHFXULW\

7KLV HYHQW LV IXQGHHG E\ *62&6 D VXEV@L@Q@V@L@S@U@F@W@R@N@L@O@V@)X@V@H@L@Q@X@Q@C